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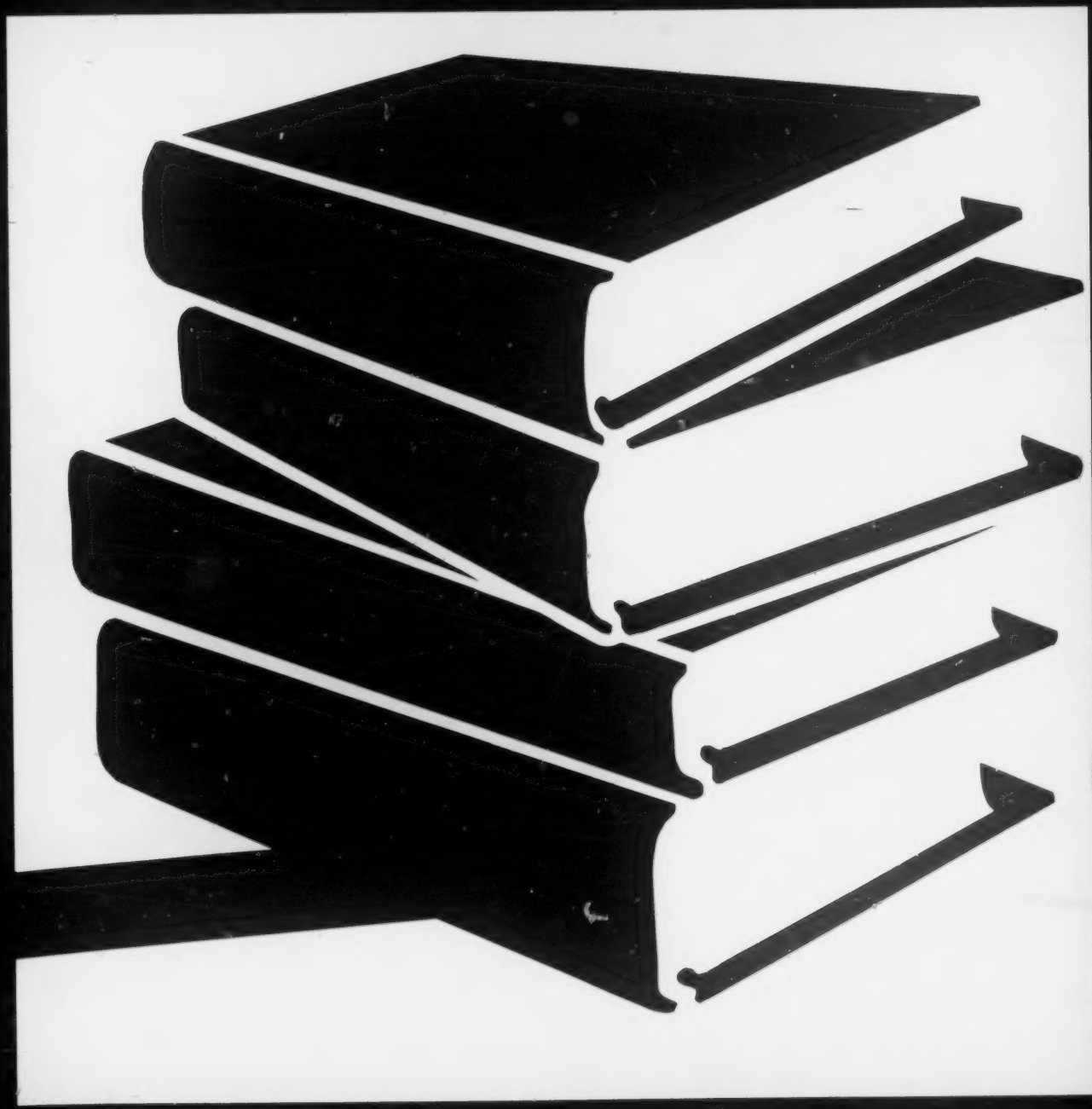
INTERNATIONAL FAMILY PLANNING PERSPECTIVES

Fertility Change and Women's Education

Stalls in Fertility Decline
Sterilization Regret in Sri Lanka
Periodic Abstinence in 12 Countries



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Editorial Office:
111 Fifth Avenue
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UPDATE

Botswana Makes Big Progress

Preliminary data from the Demographic and Health Survey conducted in Botswana in 1988 offers evidence that fertility has fallen substantially in the southeastern African nation.[1] For example, the total fertility rate (TFR) found in preliminary analyses was 5.0 lifetime births per woman, which represents a big decline from previously registered TFRs of 7.0 in 1981 and 6.5 in 1984. Although current contraceptive use had risen by only five percentage points among women in a union (from 28 to 33 percent), reliance on modern methods jumped from 19 percent to 32 percent of currently married women. Almost half of women who used a method relied on the pill.

1. "Survey Report: Botswana," *Population Today*, Apr. 1989, p. 5.

Back to the Drawing Board?

Recent clinical research into a levonorgestrel-releasing intracervical device (ICD)—that is, a hormonal contraceptive device resembling the IUD but designed to rest just inside the woman's cervix rather than inside the uterus—has shown the ICD to be associated with a relatively low two-year pregnancy rate but a fairly high expulsion rate.[1] Almost 200 Finnish women originally had agreed to use the device, and 57 percent were still using it two years later. The cumulative failure rate after two years was 3.5 percent; all seven pregnancies occurred in the first year of use, and six were the result of unnoticed expulsion of the device. Eighteen of the 200 women expelled the device but did not become pregnant, for an expulsion rate of nine percent. Another 30 percent of the women had the devices removed, one-third because of bleeding problems. The investigators comment that most of the expulsions and pregnancies took place in the first six months of use, and that women relying on the device would probably have to make at least one clinic visit during the first six months to have the device checked. They concede, as well, that "further development of the design of the device may be indicated."

1. K. Ratsula, "Clinical Performance of a Levonorgestrel-Releasing Intracervical Contraceptive Device During the First Two Years of Use," *Contraception*, 39:187, 1989.

Breastfeeding Trends in the Philippines

The proportion of Philippine mothers who breastfed their newborns dropped slightly between 1973 and 1983, from 89 percent to 84 percent.[1] Although the decrease was seen across most subgroups, it was especially large among Manila residents (nine percentage points), middle-class women (seven points) and women in transition between traditional and modern employment (11 points). On the other hand, a substantial improvement was seen in the prevalence of breastfeeding among the most highly educated women (eight points) and the women in the most modern occupations (11 points). Additionally, because the proportion of women who breastfed for longer than 12 months increased somewhat over the 10-year period, the overall mean duration of breastfeeding remained unchanged.

1. B. M. Popkin et al., "Breastfeeding Trends in the Philippines, 1973 and 1983," *American Journal of Public Health*, 79:32, 1989.

Japan Leads World in Assistance

The Japanese have surpassed all other developed nations in their provision of aid to the developing world: Their government's official development assistance budget of 1.4 trillion yen (or more than $11 billion) for 1989 is 25 percent more than the comparable amount of U.S. aid ($8.9 billion).[1] However, the type of aid offered by Japan differs somewhat from that given by other developed countries. For example, while 97 percent of the funds provided by the United States and 99 percent of the aid supplied by Great Britain come in the form of grants, only 62 percent of Japanese support is furnished through grants, with the remainder being provided through high-interest loans. Also, some observers have charged that Japanese development aid is all too often targeted at large, capital-intensive construction projects rather than at low-tech rural health projects, and that many Japanese-funded activities have adversely affected the environment in recipient countries.

1. H. F. French, "Japan Becomes World's #1 Aid Giver," *World Watch*, Mar.–Apr. 1989, p. 40.

World Strategies Against AIDS

With the number of cases of AIDS and HIV infection climbing steadily throughout the developing world, many organizations are devising novel ways of reaching men and women at risk of infection.[1] For example, the Ministry of Health in Zambia organized a workshop intended to inform traditional healers about AIDS and HIV infection. After the workshop, the medicine men, diviners and healers who participated were almost twice as likely as before to know that blades traditionally used for tattooing or making ritual marks can help spread HIV, and were more than twice as likely to know that HIV is the cause of AIDS and that one can be infected without having symptoms. In addition, the percentage who claimed that they themselves or someone they knew could cure or treat AIDS dropped from almost three-quarters to less than half. Meanwhile, two other African nations have utilized popu-

lar songs to spread information about HIV and AIDS. In nonelectrified rural villages of Sierra Leone, residents occasionally borrow a portable electrical generator to run a tape machine for a "disco night"; danceable songs about HIV education and prevention have been played at such discos to inform young people about AIDS. In Ghana, a division of the Health Ministry organized a contest for songs about AIDS. The contest attracted more than 100 entrants, and after the 10 best songs were selected (based on their message, beat and cultural acceptability), they were played at a free concert in Accra attended by 2,000 people.

1. "Country Watch," *AIDS Health Promotion Exchange*, No. 4, World Health Organization Global Programme on AIDS, Geneva, 1988, pp. 7–10.

NORPLANT Gets Preliminary OK

The Maternal Health Committee of the U.S. Food and Drug Administration (FDA) recommended on April 27 that the FDA, which decides what drugs and devices may be sold in the United States, approve the NORPLANT system of hormonal contraceptive implants.[1] It is expected that the FDA will announce its final decision within the next few months. NORPLANT is now approved for general use in 10 developing countries (Chile, China, Colombia, the Dominican Republic, Ecuador, Indonesia, Peru, Sri Lanka and Venezuela), as well as in Finland and Sweden. Research on NORPLANT has been conducted in another 29 countries.[2]

1. "U.S. Panel Endorses Birth Control Implant," *New York Times*, Apr. 28, 1989, p. 14.

2. "41 Countries Have Implant Experience," *NORPLANT Worldwide*, No. 12, Dec. 1988, p. 1.

Nigeria Under Pressure

Facing an annual growth rate of 3.3 percent and the prospect of the world's third largest population by the year 2050 (about 564 million), the government of Nigeria has announced that it is taking serious steps to reduce future levels of population growth.[1] The primary aim is to limit at least 80 percent of Nigerian women to families of only four children—two fewer than the current average. In addition, the government plans to make it harder for Nigerian women to marry before age 18, and expects to offer primary health care services (defined as those encouraging birth spacing, breastfeeding, better nutrition and utilization of immunization services and clean water) in every local governmental jurisdiction, even though only about one-third of such areas now have these services.

1. J. L. Jacobsen, "Nigeria Opts for Smaller Families," *World Watch*, Mar.–Apr. 1989, p. 9.

DHS Takes the Next Step

With the survey fieldwork now completed in 28 of the 30 developing countries participating in the first stage of the Demographic and Health Surveys (DHS) project, the Institute for Resource Development/Westinghouse (IRD) has embarked on the second stage, dubbed DHS-II.[1] The next step will involve the fielding of 25 new surveys—half of them in Sub-Saharan Africa—as well as 25 further analyses of the data that have already been collected and the establishment of a permanent data archive. In addition, two new series of publications—the DHS Comparative Studies and the DHS Methodological Reports—will be introduced. Finally, the IRD is planning to offer five one- or two-year fellowships to young researchers from developing countries.

1. "DHS Enters New Phase of Research and Training," *Demographic and Health Surveys Newsletter*, Vol. 2, No. 1, 1989, p. 1.

New Lab Test for HIV

The U.S. Food and Drug Administration has approved a new blood test that can identify the presence of antibodies to the human immunodeficiency virus (HIV) in just five minutes.[1] The new technique, which uses genetically engineered proteins to detect the presence of HIV antibodies, is not as accurate as the standard ELISA test, but it is expected to cost between one-half and one-fifth as much as the ELISA test. Because of the new technique's lower cost and the ease with which it can be performed, the FDA believes that it will be much better suited to developing country settings than the ELISA test.

1. "New Recombigen LA Test for HIV Approved, But Accuracy Questioned," *AIDS Alert*, 4:26, 1989.

Schooling and Fertility In Pakistan

Besides being perhaps the most important independent determinant of fertility in Pakistan, women's education may also be the most useful marker for women's status there.[1] If this is so, then current education levels among male and female children indicate that gender inequality in Pakistan is likely to remain unchanged for the foreseeable future: Urban boys are three times more likely than urban girls to be attending school, while rural boys are more than six times more likely than rural girls to be in school; in one rural region (Sind), boys are 16 times more likely than girls to be going to school. Although the male and female children of the most highly educated and modern Pakistanis are equally likely to be in school, the investigators conclude that "the perpetuation of gender inequality through differential education of boys and girls is strong throughout much of Pakistani society."

1. Z. Sathar et al., "Women's Status and Fertility Change in Pakistan," *Population and Development Review*, 14:415, 1988.

No AIDS Vaccine on the Horizon?

High-level AIDS experts such as Jonathan Mann, director of WHO's Global Programme on AIDS, and the directors of the U.S. Centers for Disease Control and the U.S. Food and Drug Administration now believe that a vaccine against the human immunodeficiency virus (HIV) is further off than had originally been hoped.[1] Among their reasons for discouragement are the unexpected biological complexity of HIV, the inadequacy of animals as test subjects for a vaccine and the freedom with which HIV travels through the body (either through the bloodstream or inside body cells). Although 10 vaccines are being investigated in the United States alone, none is likely to be in general use for at least another 10 years.

1. "Outlook Poor for Rapid Development of AIDS Vaccine," *AIDS Alert*, 4:1, 1989.

Men Favor Condoms with Spermicide

A study conducted last year in Bangladesh, Egypt, Ghana, Honduras and Mali indicates strong support for spermicidally lubricated condoms: Of more than 600 men who were given a month's supply of one of two brands of such condoms, the vast majority liked them, and at least three-quarters preferred them to their usual brand.[1] A surprising subsidiary finding of the study was that three-fifths of the respondents believed the new condoms to be thinner than their usual brand, even though there was no real difference in the thickness of the condoms. The fact that they perceived better lubricated condoms as being thinner is an indication of how the addition of spermicidal lubrication may increase the acceptability of condoms.

1. L. S. Potter, N. E. Williamson and K. Clarke, "Acceptability of Spermicidally Lubricated Condoms in Five Developing Countries and Related Policy Issues," paper presented at the Fourth International Conference on AIDS, Stockholm, June 12–16, 1988.

Women's Education and Fertility: A Decade of Change in Four Latin American Countries

The educational attainment of adult women is increasing rapidly enough to produce important fertility declines. However, declines within educational categories, particularly among the least educated, have also been impressive.

By Mary Beth Weinberger, Cynthia Lloyd and Ann Klimas Blanc

Summary

New survey data show that there has been a rapid fertility decline in four Latin American countries. Furthermore, in three of the four (Colombia, the Dominican Republic and Ecuador), the gap in fertility between educated and uneducated women, which had been very wide during the 1970s, has begun to narrow. However, educational differentials in fertiity remain substantial, particularly in Peru, where the educational differential has remained as overali fertility has declined.

Women of reproductive age in these four countries have completed 6–7 years of schooling, on average, although the proportion of women with no education or with only a few (1–3) years ranges from 23–31 percent. As well as having lower fertility and desiring smaller families, women with more education generally marry later and are more likely to practice contraception than are less-educated women.

In all four countries, women's educational attainment has been rising rapidly enough that the increase in the proportion of more highly educated women has by itself been an important cause of fertility decline. Improvements in education alone would explain 40–67 percent of the fertility decline if there had been no change in behavior within the education groups. At the same time, fertility declines within education groups have been large, and in three of the four countries have contributed over half of the observed fertility decline. In addition, contraceptive use increased substantially within education categories, while desired family size appears to have fallen. There has also been a trend within education groups toward earlier or more universal marriage, an unexpected finding.

Mary Beth Weinberger is population affairs officer of the Population Division of the United Nations (UN). At the time this article was written, Cynthia Lloyd was chief of the Fertility and Family Planning Studies section of the UN Population Division; she is now senior associate and deputy director of the Research Division of The Population Council. Ann Klimas Blanc is a country monitor at the Institute for Resource Development/Westinghouse, Columbia, Md. The views expressed here are those of the authors, and do not necessarily reflect the views of the UN.

Introduction

Of all the social factors that have been widely studied for their impact on fertility, women's educational attainment is the one that has proved most consistently and strongly related to fertility. Cross-national comparisons of data from developing countries reveal a variety of patterns in both the size of fertility differentials by education and the level of education at which fertility begins to decline sharply.[1] A United Nations (UN) study based on data from the World Fertility Surveys (WFS) found that the size and pattern of these differences varied according to such country characteristics as region, level of socioeconomic development and phase of the fertility decline.[2] In general, fertility differentials according to education were found to be larger in the relatively more developed of the developing countries. Additionally, the educational differentials in fertility seen in most developing countries appeared to have widened during the period leading up to the WFS (for most countries, the mid-to-late–1970s), primarily because of decreased fertility among the more educated but also in some cases because of small increases in fertility among those with little or no education.

Latin America stood out in the UN study as the region having, on average, the largest differentials in fertility by women's education. The mean difference between the total fertility rate (TFR) of women with no education and the TFR of women with seven or more years of schooling was 3.6 children per woman in Latin America, 3.1 in Asia and 2.0 in Africa.[3] One analysis concluded that "instances of very wide differentials probably reflect the early stages of the transition to lower, deliberately controlled fertility."[4]

With the advent of data from the Demographic and Health Surveys (DHS) program—an international survey program implemented by the Institute for Resource Development/Westinghouse and funded by the U.S. Agency for International Development—it is now possible to take a preliminary look at recent trends in fertility and related variables, according to women's education, for some of the countries that also participated in the WFS program. For this article, we chose to study four Latin American countries—Colombia, the Dominican Republic, Ecuador and Peru. The choice was a practical one because they were among the relatively few countries participating in the DHS for which data were available at the time this analysis was conducted. However, the choice was also strategic, given the very large education-related fertility differentials found among the four countries in the mid-to-late–1970s (a difference of four or more children between extreme education categories), as well as the relatively large fertility declines seen in those countries over the last 10 years.

In all four DHS samples and in three of the four WFS samples, all women aged 15–49 were interviewed. In the case of the Peru WFS, the main interview covered only ever-married women; the household survey, conducted in conjunction with the individual interviews, provided information about the proportion of women who had never married, by age and education, and this information was used to adjust many of the statistics shown here to reflect the experience of all women.* All the surveys were nationally representative, ex-

*In the case of fertility measures, the adjustment for Peru involves the assumption that single women had had no children.

cept that in both the WFS and the DHS, a few sparsely populated areas containing less than five percent of the population in Colombia and Ecuador were excluded, and that in the Peru DHS, areas containing six percent of the population were excluded for security reasons. Data collection and tabulation procedures were closely comparable for the measures examined here, except as noted in the discussion below. The WFS was conducted in these four countries between 1975 (the Dominican Republic) and 1979 (Ecuador); the Colombia, Dominican Republic and Peru DHS took place in 1986, while the Ecuador DHS was conducted in 1987. The intervals between the surveys vary from approximately seven years in Ecuador to 11 years in the Dominican Republic.*

Despite their proximity, the four countries considered here are at different stages of demographic transition and socioeconomic development. Although fertility levels in these countries have converged somewhat during the decade under study, a concomitant trend in indices of socioeconomic well-being has not been as apparent. The per capita gross national product (GNP), expressed in constant dollars, was stagnant or declined in all of these countries between 1980 and 1985, although Colombia, the Dominican Republic and Ecuador experienced growth in real per capita GNP (ranging from seven to 14 percent) over the full decade 1975–1985.† Peru, on the other hand, provides a contrast with the other three countries, with a decline in real per capita GNP of roughly 15 percent over the decade.

Peru also lags behind the other countries when infant mortality rates are compared: Over the five years preceding the DHS surveys, Peru's infant mortality rate was 76 infant deaths per 1,000 births, while that of the Dominican Republic was 68 per 1,000, Ecuador's infant mortality rate was 58 per 1,000 and Colombia's was 33 per 1,000.‡ On the other hand, fertility levels in Ecuador and Peru are now roughly the same (TFRs of 4.3 and 4.5 births per woman, respectively, for the five years before the DHS), while fertility rates in Colombia and the Dominican Republic are distinctly lower (TFRs of 3.3 and 3.8, respectively).

In this article, we examine the association between women's education and levels of fertility (and several fertility-related variables) at the times of the WFS and the DHS. Our aim is to determine whether educational differentials in fertility have widened, have narrowed or have been stable over this period, and how much of the overall fertility trend might be attributed simply to changes in educational attainment now that women with more education (who generally have lower fertility) make up a larger proportion of the population. To do this, we use a "components-of-difference" approach.§

The analysis described here relies on standard, basic measures of fertility and related phenomena—the types of statistics shown in many survey reports. However, because different classifications have been employed in published work based on the WFS and DHS, particularly for comparisons by education, some new tabulations were needed. We have restricted our focus to overall educational differentials and have left for future work the more exhaustive task of examining the independent impact on fertility of education when the influences of other demographic and socioeconomic variables are controlled for. At the same time, numerous earlier studies provide grounds for confidence that the relationship between women's education and fertility is not merely an artifact of education's association with other social or economic variables: The introduction of statistical controls for such factors generally diminishes the size of educational differentials in fertility, but those that are large to begin with usually remain relatively large.[5]

Trends in Education

At the time of the DHS, Colombian women aged 15–49 had completed 5.8 years of schooling, on average, while women in Peru and the Dominican Republic had completed 6.8 years of education and those in Ecuador had finished 7.1 years of schooling (Table 1, page 6). The lower average among Colombian women is due not to a higher percentage of women with no schooling but rather to a much more concentrated distribution of educational attainment, with 62 percent of the women having six years of schooling or less and only 17 percent having 10 or more years. In contrast, the percentage of women with 10 or more years of education in the other three countries ranges from 28 percent to 35 percent. Peru has the highest percentage of women with no schooling (11 percent), as well as the highest percentage with 10 or more years of schooling (35 percent).

Data from the DHS and the WFS can be compared for evidence of recent trends in educational attainment. At the time of the DHS, the average educational attainment of a woman of reproductive age was roughly 1–2 years greater than at the time of the WFS. The amount of change in educational attainment was smallest in Ecuador, but once the number of years between surveys is taken into account, the average annual growth in educational attainment among ever-married women was slowest in Colombia (0.12 years of education per annum) and most rapid in Peru (0.23 years per annum). Increases in educational attainment are particularly notable at the upper end of the educational distribution, with the proportion of women with seven or more years of schooling rising anywhere from 10 percentage points (in Ecuador) to 22 percentage points (in the Dominican Republic) between the two surveys.

A comparison of mean educational attainment by age between the two surveys provides further evidence of these trends

*The amount of time between the midpoints of survey fieldwork was 10.4 years for Colombia, 11.3 years for the Dominican Republic, 7.4 years for Ecuador and 9.2 years for Peru.

†This information was derived from the UN Population Division's Population, Resources, Environment and Development data bank, based on estimates of real GNP per capita (in constant dollars) as estimated from World Bank income data and Population Division estimates of population growth. World Bank estimates of per capita GNP for 1985 (in current U.S. dollars) are $1,320 for Colombia, $760 for the Dominican Republic, $1,160 for Ecuador and $1,010 for Peru. (See: World Bank, *World Tables, 1987: The Fourth Edition*, Washington, D.C., 1988.)

‡UN estimates of infant mortality for the period 1980–1985 are higher than the DHS estimates, but the pattern of intercountry differences is similar. For Peru, the UN estimate is 99 deaths per 1,000 births, while rates are 70–75 deaths per 1,000 in the Dominican Republic and Ecuador and 50 deaths per 1,000 in Colombia (see: *World Population Prospects, 1988*, ST/ESA/SER.A/106, New York [forthcoming]). It should be noted that although the DHS fertility and mortality data that are discussed in this article represent the most recent available data, their quality has yet to be fully evaluated.

§The components-of-difference technique employs the statistical method of direct standardization to address such hypothetical questions as: How much would the overall fertility level have changed if fertility had remained constant within educational groups but the educational attainment of women had changed in the manner actually observed between the two surveys? How much would fertility have changed if the educational distribution had remained constant but education-specific fertility rates had changed in the manner actually observed? Such calculations are described in detail in the footnote on page 12. (For a more complete explanation of this approach, see: E. Kitagawa, "Components of a Difference Between Two Rates," *Journal of the American Statistical Association*, 50:1168, 1955; for a general discussion and for illustrations of direct standardization, see: H.S. Shryock and J.S. Siegel, *The Methods and Materials of Demography*, U.S. Department of Commerce, Washington, D.C., 1971.)

Table 1. Selected indicators of women's education, marital patterns, fertility, contraceptive use and breastfeeding behavior and fertility preferences, all among 15–49-year-old WFS and DHS respondents, by country and survey

Indicator	Country and survey							
	Colombia		Dominican Republic		Ecuador		Peru	
	WFS 1976 (N= 5,339)	DHS 1986 (N= 5,331)	WFS 1975 (N= 3,110)	DHS 1986 (N= 7,649)	WFS 1979 (N= 6,781)	DHS 1987 (N= 4,713)	WFS 1977 (N= 5,419*)	DHS 1986 (N= 4,999)
EDUCATION								
Mean no. of years completed								
All	4.4	5.8	4.7	6.8	5.9	7.1	u	6.8
Ever-married	3.7	5.0	3.9	5.9	5.2	6.3	3.8	5.9
% distribution of women by no. of years of education								
0	12	6	13	6	10	8	23	11
1–3	33	25	31	21	21	15	21	18
4–6	31	31	29	25	35	33	24	20
7–9	17	21	16	21	16	16	}32	16
≥10	8	17	11	28	19	29		35
Total	100	100	100	100	100	100	100	100
MARRIAGE								
Singulate mean age at marriage	22.1	23.6	20.5	21.5	22.1	22.2	23.2	23.1
% single								
At 20–24	44	48	27	37	43	41	49	51
At 45–49	9	5	3	2	6	3	6	4
% distribution of time from ages 15–49† spent								
Single	28	28	17	20	25	23	27	26
In a union	61	60	66	63	66	69	65	66
Legal	46	41	28	26	48	48	51	48
Consensual	15	19	38	37	18	21	14	18
Divorced/separated	8	9	15	15	6	6	6	6
Widowed	3	3	2	2	3	3	2	2
Total	100	100	100	100	100	100	100	100
FERTILITY								
TFR in 5 years before survey	4.7	3.3	5.7	3.8	5.3	4.3	5.6	4.5
Mean no. of children ever born to women 40–49	6.4	5.5	6.5	6.2	6.6	5.7	6.8*	6.2*
% of reproductive years spent with a child under six†	43	37	47	38	48	44	47	44
CONTRACEPTION & BREASTFEEDING								
% of currently married women currently using a method	43	65	32	50	34	44	31	46
Mean duration of breast-feeding (in months)‡	9	11	9	9	13	14	13	16
FERTILITY PREFERENCES								
Mean no. of children preferred	3.5	2.7	4.3	3.4	3.5	3.1	3.8*	2.9*
% who want no more children§								
Observed	61	70	52	63	56	63	61	70
Standardized **	55	70	46	64	48	62	52	68

*Ever-married women only. †Synthetic cohort estimates.

‡Prevalence-incidence estimates, based on births in the preceding 24 months for WFS, 36 months for DHS.

§Including women sterilized for contraceptive reasons. For the WFS, based on currently married fecund women; for the DHS, based on all currently married women aged 15–49.

**Standardized for number of living children (including current pregnancy), using as standard the family-size distribution from the Colombia DHS.

Note: u=unavailable.

Sources: S. Balkaran and D.P. Smith, *Socioeconomic Differentials in Breastfeeding, WFS Comparative Studies: Additional Tables*, World Fertility Survey, London, 1984, see reference 16; B. Ferry and D.P. Smith, "Breastfeeding Differentials," WFS Comparative *Studies No. 23*, International Statistical Institute/World Fertility Survey, Voorburg, the Netherlands, 1983; United Nations, 1987, see reference 2; and special tabulations.

(Figure 1, page 8), and shows that WFS and DHS data agree closely for most cohorts covered by both surveys. Educational attainment is higher in the cohort of women aged 25–29 at the time of the DHS than in the same birth-cohorts at the time of the WFS; the probable reason for this difference is that a nontrivial number of these women were still in school at the time of the earlier survey. If this is so, it may be that as women aged 15–24 at the time of the DHS grow older, their educational attainment will rise even further. Otherwise, trends in the two data sets appear largely consistent, confirming that the definition of educational attainment was reasonably comparable between the two surveys and demonstrating the steady rise in educational attainment over time.

Further evidence of the dramatic changes that have occurred in women's education can be seen in Figure 2 (page 10), which shows the marked decline in the percentage of women with no education.* In each country, only 2–3 percent of women aged 15–19 at the time of the DHS had no education; on the other hand, in the cohort born 40 years earlier (the oldest women interviewed in the WFS, who were 55–59 at the time of the DHS), the proportion with no education ranged from 23 percent in Ecuador to 43 percent in Peru.

Changes in Fertility and Other Variables

Changes in fertility over the decade derive from changes in the principal proximate determinants of fertility—marriage, contraceptive use and breastfeeding—that are described below. Trends in fertility preferences, which might motivate changes in fertility, are also addressed.

Several indicators of marriage timing and marital status ("marriage" in this discussion includes consensual as well as legal unions) are shown in Table 1. The four countries considered here are fairly typical of the region; the singulate mean age at marriage at the time of the WFS was in the range of 22–23 years in the three South American countries and was lower (20.5 years) in the Dominican Republic.

On occasion, the singulate mean age at

*In the Dominican Republic, the proportion who had completed no years of education, as reported in WFS individual interviews, was several percentage points greater than the proportion with no education reported in the WFS household interviews or in the DHS (see Figure 2). The trend is very similar in all sources. In Peru, the proportions from the WFS individual interview are shown only for cohorts aged roughly 30 or more at the time of the interview; the exclusion of single women from the Peru WFS distorts the pattern among younger women.

marriage can give a misleading impression of trends in marriage timing.[6] Consequently, Table 1 also includes the proportion single at ages 20–24 (as an indicator of the extent of early marriage) and summary measures of the amount of time spent in various marital or union statuses. All indicators suggest that although age at marriage in the Dominican Republic rose between the two surveys (by one year in the singulate mean age), it has remained lower there than in the other countries. There was very little change in age at marriage in the three South American countries. In Colombia, although the singulate mean age increased by 1.5 years, there were only minor changes in the proportion single at ages 15–29, the ages at which most marriages occur (not shown): Among 20–24-year-olds, the proportion single was four percentage points higher at the time of the DHS than at the time of the WFS, while it was only one percentage point higher among women 15–19 and among women 25–29.

According to the DHS data, only 3–5 percent of 45–49-year-old women in the three South American countries have never been in a union; in contrast, WFS data showed that 6–9 percent of women had never entered a legal or consensual union by the end of their reproductive years. This is a higher level than in most developing countries, although it is not high by developed-country standards. Either the DHS obtained a more complete reporting of unions—the reporting of consensual unions indeed being often problematic—or there has been a genuine increase in the proportion marrying. In contrast, in the Dominican Republic, both surveys found that only 2–3 percent of women remain single by the end of their reproductive years.

Women in the four countries are estimated to spend 60–69 percent of their reproductive years in a marital union and to be single for 20–28 percent of those years.* Only 2–3 percent of the reproductive years, on average, are spent as a widow; a typical woman in the three South American countries can expect to spend 6–9 percent of her reproductive years divorced or separated, compared with 15 percent in the Dominican Republic. These patterns remained remarkably stable between the WFS and the DHS. Consensual unions are prevalent in all of the countries, but only in the Dominican Republic are they more common than legal marriages. Since the WFS, there has been a shift in the distribution between legal and consensual unions in the three South American countries, suggesting either that consensual unions are becoming more common or that women are becoming more willing to report them.

When the four countries' WFS surveys were conducted in the mid-to-late–1970s, fertility levels ranged from 4.7 children per woman in Colombia to 5.7 in the Dominican Republic, despite moderate levels of contraceptive use (31–43 percent of married women were practicing contraception). Even at the time of the WFS, however, fertility in the four countries had already declined substantially, as can be seen by comparing the TFR to the number of children ever born to older women. Currently, the highest fertility among the four countries is found in Peru and Ecuador (TFRs of 4.5 and 4.3 births per woman, respectively), followed by the Dominican Republic (3.8) and Colombia (3.3). Between the WFS and the DHS, the TFR declined by amounts ranging from 1.0 births per woman (18 percent) in Ecuador to 1.9 births per woman (33 percent) in the Dominican Republic. On an annual basis, the TFR declined by about two percent per year in Ecuador and Peru and by about three percent per year in Colombia and the Dominican Republic (not shown).

The indicators in Table 1 suggest that most of the recent fertility decline in these countries may have resulted from increased contraceptive use, since the other major proximate determinants of fertility—marriage and the duration of breastfeeding—showed little change over the period. (It is impossible to tell from available data whether induced abortion contributed to the trend.) The growth in contraceptive prevalence ranged from 10 percentage points in Ecuador to 22 percentage points in Colombia, with a 15 percentage-point gain in Peru and an 18 percentage-point rise in the Dominican Republic. The fertility effect to be *expected* as a result of these increases can be estimated using the Bongaarts proximate determinants model[7] (which also takes into account the estimated effectiveness of the contraceptive methods used).†

The model confirms that changes in contraceptive practice are large enough to account for most or all of the overall fertility trend, as can be seen below, where the observed percentage change in fertility is compared with the "expected" change as a result of contraceptive use:

Country	Observed	Expected
Colombia	29	38
Dominican Republic	34	30
Ecuador	19	17
Peru	20	19

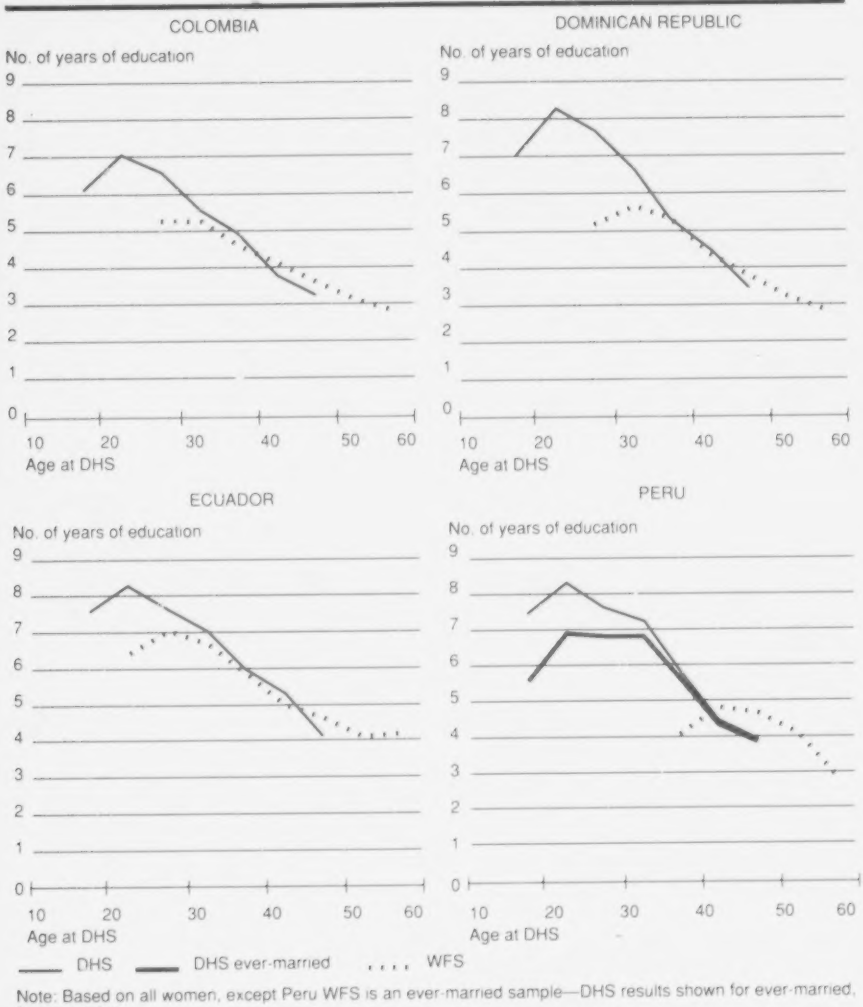
Differences between the observed and expected changes could be due to a variety of factors, including changes in fertility determinants other than contraceptive use, imperfections in the data and approximations used in the model itself. The larger increases in contraceptive prevalence occurred in the countries with the more active family planning programs: Ecuador and Peru had relatively weak family planning programs in the early 1980s, in contrast to the Dominican Republic, which had a moderately strong program, and Colombia, which had a very strong program.[8]

At both surveys, the mean duration of breastfeeding was several months shorter in Colombia and the Dominican Republic (9–11 months) than in Ecuador and Peru (13–16 months). The average durations did not decline between the WFS and the DHS, and indeed appear to have increased by 1–3 months in Colombia, Ecuador and Peru. A decline in breastfeeding duration might have been expected on the basis of cross-sectional data indicating both that the duration of breastfeeding is generally shorter in the more economically advanced countries and that the length of breastfeeding decreases as educational attainment rises.[9] The apparent increase in the duration of breastfeeding must be examined in greater depth before one can conclude that it is genuine, but trend data for other developing countries show a mixture of instances of decreasing, stable and increasing duration of breastfeeding rather than a generalized decline in the practice.[10] Increases have been reported in several other Latin American countries, including Costa Rica, Guatemala, Panama and Paraguay.[11] The recent publicity given to the health advantages of breastfeeding may well have had an effect on breastfeeding practice.

*The synthetic-cohort estimates of the proportion of a woman's reproductive years (ages 15–49) spent in each union status are calculated by summing the proportions currently in the status over five-year age-groups, multiplying by five and dividing by the number of reproductive years (35). As with other synthetic-cohort measures discussed here, this measure does not make allowance for women's risk of death before age 50.

†The expected percentage change in fertility due to change in contraceptive practice is calculated as 100(1-C_c(DHS)/C_c(WFS)), where the C_c indices (which represent the effect of contraceptive practice at the time of the WFS and DHS) are calculated as described in Bongaarts and Potter (see: reference 7), using the following method-specific estimates of use-effectiveness: sterilization, 1.0; IUD and injectables, 0.95; pill, 0.90; others, 0.70. Method distributions at each survey are shown in the main survey reports and in United Nations, *Levels and Trends of Contraceptive Use as Assessed in 1988*, ST/ESA/SER.A/110, 1989.

Figure 1. Mean number of years of education completed, for women, by age at the time of the DHS survey



Note: Based on all women, except Peru WFS is an ever-married sample—DHS results shown for ever-married, for comparison.

It is worth noting that breastfeeding remains an important determinant of natural fertility levels in these countries. Breastfeeding durations averaging 9–16 months can be expected to reduce fertility levels to roughly 15–30 percent below the level that would be observed in the absence of breastfeeding, based on a calculation of the Bongaarts index of postpartum infecundability.[12] However, the increases between the WFS and the DHS in average breastfeeding duration (amounting to 1–3 months) would be expected to decrease fertility levels by only about 3–8 percent, as calculated from the ratio of the indices of postpartum infecundability associated with each country's duration of breastfeeding at the WFS and the DHS. Thus, these increases are of importance more for their potential health effects than for their relatively modest contribution to overall fertility decline.

At the time of the WFS, the mean number of children preferred by women in the four countries ranged from 3.5 to 4.3, lower than the TFR by amounts ranging from 1.2 to 1.8 children per woman. Ideal family size as measured in the DHS, however, is around 10–25 percent lower than the preferred family size as measured in the WFS. Different question wording in the WFS and the DHS was probably responsible for some (but not all) of the apparent decline in preferred family size.* An experimental survey conducted as part of the Peru DHS suggests that the change in wording between surveys accounted for about 20 percent of the overall decline in ideal (or preferred) family size in that country: Of two samples of women interviewed in the DHS, one was asked the standard DHS question, while the other answered the question as it had been worded in the WFS. The WFS wording produced a preferred family size about one-quarter child higher than did the DHS wording.[13] (The data on Peru shown in Table 1 are derived from the response to the standard DHS question.)

A second indicator of fertility intentions also shows a decline in preferred family size in all four countries. At the time of the DHS, roughly two-thirds of married women of reproductive age either wanted to have no more children or had been surgically sterilized for contraceptive reasons. At the time of the earlier survey, the percentages were 7–11 points lower, and were 14–18 points lower after standardization for current family size. It is important to note that the base population differs at the two dates;† however, as is not the case for the "ideal family size" measure, this lack of comparability is unlikely to have produced an overstatement of the amount of change. Increases in the proportion intending to have no more children are especially marked among women with 2–4 children (not shown). For instance, in the DHS, between 56 and 69 percent of women with two children intended to stop having children (a mean of 63 percent), while in the

*The question in the WFS was: "If you could choose exactly the number of children to have in your whole life, how many children would that be?" In the DHS, this question wording was retained for respondents who had no children, but women who had children were asked: "If you could go back to the time [when] you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" The DHS question was framed in this way in the hope that such an approach would reduce any reluctance on the woman's part to report a number lower than her current family size.

†The base population in the DHS was all currently married women, while in the WFS, women who thought they were infecund (and thus were not questioned about their desire for more children) were excluded. Because of differences in questions about fecundity status, it is not possible to construct the same base population for the DHS. However, to check on the importance of the difference between base populations, DHS tabulations were prepared based on "behaviorally infecund" married women (i.e., currently married women who had a noncontraceptive open birth interval of at least five years). The "fecund" base produces proportions wanting no more children that are higher by 1–3 percentage points than those for the currently married base, which are shown in Table 1. The data in the table are therefore thought to give a conservative indication of the amount of change. None of the results discussed here differ substantially if the "married fecund" base population is used for the DHS in place of the "currently married" base.

WFS, the proportions ranged from 33 to 50 percent†, with a mean of 43 percent.

An obvious consequence of high fertility is that women have young children to care for during an extended portion of their lives. We estimate here the proportion of a woman's reproductive years spent with a young child and examine the impact of education on this proportion. For this discussion, we concentrate on synthetic-cohort estimates of the amount of time women spend with a young child, based on age-specific tabulations of the percentage of women who currently have a child aged under six.* The degree of conflict between child care and women's other activities depends on many factors, most obviously on the availability of child care from other sources (including the woman's spouse and older children as well as other relatives and nonrelatives) and on the extent to which other activities can be combined with child care. We have no direct evidence on these points.

On average, given fertility patterns at the time of the DHS, women can expect to spend between 37 and 44 percent of their time between ages 15 and 49 with one or more children under six. This represents a decrease of 3–9 percentage points (equivalent to roughly 1–3 years) from values seen at the time of the WFS. In proportional terms, the declines in this variable are smaller than those observed for the TFR: The latter amounted to 18–33 percent of levels found in the WFS, compared with declines of 6–19 percent in the amount of time with a young child. Such smaller declines are to be expected in general, particularly where intervals between births are short, as tends to be the case in Latin America.† A trend toward wider birthspacing, which the WFS data suggested was already under way in some Latin American countries,[14] and declines in infant and child mortality may have partially countered the effect of declining fertility levels on the time spent in child care. Still, in Colombia and the Dominican Republic, declines in the number of births have led to a reduction of 2–3 years in the average length of time women can expect to spend caring for young children.

Table 2. Change in selected rates and percentages between WFS and DHS, by women's education, according to country

Indicator & education	Colombia			Dominican Republic			Ecuador			Peru		
	WFS	DHS	Abs. change	WFS	DHS	Abs. change	WFS	DHS	Abs. change	WFS	DHS	Abs. change
TFR (for 5 yrs. preceding survey)												
None	7.1	5.4	−1.7	7.0	5.6	−1.4	7.8	6.4	−1.4	7.3*	7.0*	−0.3*
Primary	5.2	4.2	−1.1	6.1	4.4	−1.7	6.2	5.2	−1.0	6.8	6.1	−0.7
Secondary	2.7	2.5	−0.2	2.7	2.9	0.2	2.8	3.1	0.2	5.1	4.7	−0.4
Higher	2.5	1.5	−1.0	1.3	2.2	0.9	2.0	2.3	0.3	3.3	2.9	−0.3
% of currently married women currently using a method												
None	22	51	29	17	38	20	12	18	6	12	19	7
1–3 years	34	61	26	26	47	21	20	37	16	24	33	9
4–6 years	51	65	14	37	51	15	36	43	7	43	46	3
7–9 years	64	73	9	46	48	3	49	50	0	51	58	7
≥10 years	67	73	6	54	57	3	58	61	3	56	66	10
% of reproductive years spent with a child under six†												
None	57	46	−11	52	52	−1	65	58	−7	57	59	3
1–3 years	50	47	−3	57	45	−11	59	55	−4	54	56	2
4–6 years	40	40	0	44	43	−1	49	48	−1	46	46	0
7–9 years	32	31	0	38	36	−2	36	37	1	33‡	33‡	1‡
≥10 years	24	24	0	22	28	6	28	32	4			
No. of years spent single before age 50†												
None	21.3	22.4	1.1	19.0	18.2	−0.9	20.2	20.2	0.0	22.3	20.3	−2.1
1–3 years	23.6	21.9	−1.7	18.6	19.0	0.4	22.1	20.1	−2.0	22.0	21.4	−0.7
4–6 years	24.6	23.4	−1.1	20.3	19.5	−0.8	23.0	21.3	−1.8	23.2	22.4	−0.9
7–9 years	26.6	25.6	−1.0	22.8	22.2	−0.6	24.0	23.1	−1.0	27.6‡	25.9‡	−1.7‡
≥10 years	27.7	29.0	1.3	27.0	25.0	−2.0	27.2	25.7	−1.4			
% wanting no more children (controlled for current family size)§												
None	49	70	21	42	61	19	40	54	14	47	63	16
1–3 years	56	71	16	45	63	18	44	63	19	52	70	18
4–6 years	56	69	13	49	66	18	50	63	13	54	68	14
7–9 years	54	72	18	47	64	17	54	62	9	57	71	14
≥10 years	59	65	6	48	62	14	57	63	6	54	69	15
Mean no. of children preferred**												
None	4.6	3.4	−1.2	5.1	3.6	−1.4	4.7	3.6	−1.1	4.2*,††	3.2*,††	−1.0*,††
Primary	3.6	2.9	−0.7	4.2	3.5	−0.8	3.8	3.4	−0.4	3.9	3.2	−0.6
Secondary	3.0	2.4	−0.6	3.6	3.1	−0.6	2.8	2.6	−0.2	3.6	2.8	−0.8
Higher	3.0	2.3	−0.6	4.1	3.2	−0.8	2.7	2.7	−0.0	3.3	2.6	−0.7

*Education categories are: 0 years, 1–3 years, 4–6 years and ≥7 years.

†Synthetic cohort estimates. ‡For women with ≥7 years of education.

§Standardized on the family-size distribution of the Colombia DHS.

**Question wording differs between the WFS and DHS. ††For ever-married women.

Note: Difference between WFS and DHS data may not equal change shown above because of rounding.

Sources: See reference 16; and special tabulations.

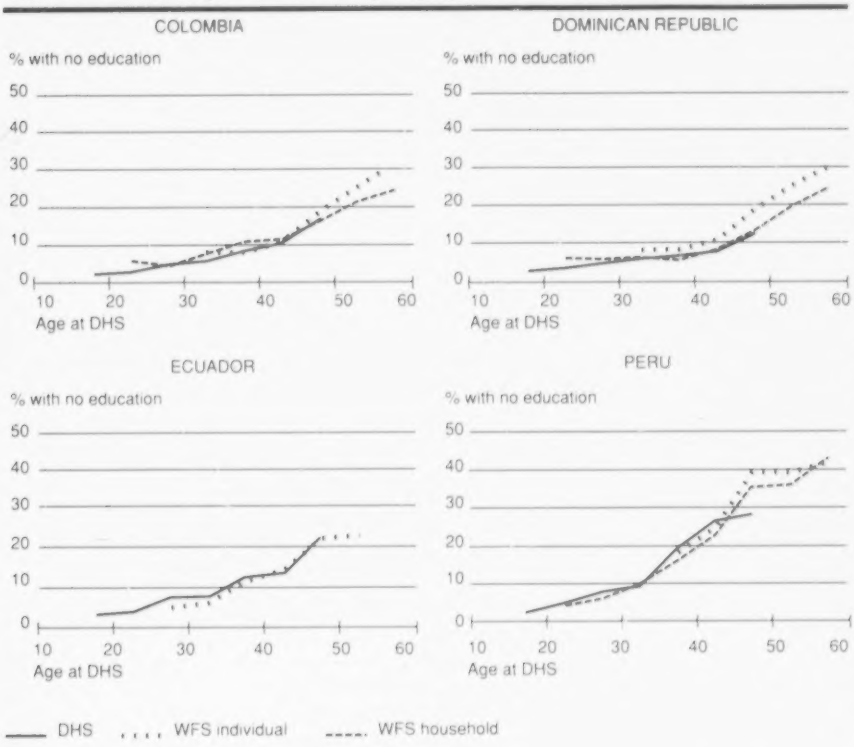
Differentials by Education

At the time of the WFS, fertility differentials by education in most Latin American countries were large and had increased in the preceding years.[15] In the four countries considered here, there was little or no evidence that fertility had begun to decline among women with no education, but rates of childbearing had dropped among women with at least four years of schooling. WFS data in Table 2 show the TFR among women with no schooling to have been very high, in the range of 7–8 chil-

*The synthetic-cohort estimates of the proportion of the reproductive years (ages 15–49) spent with a child under age six are calculated by summing the proportions who currently have a living child under age six over five-year age-groups, multiplying by five, and dividing by the number of reproductive years (35).

†For example, consider a hypothetical population in which women bear four children, all spaced three years apart. Each woman spends 15 years with at least one child under six (assuming that all mothers and children survive). A 25 percent decline in fertility levels (from four to three births per woman) decreases the amount of time spent with a young child by three years, or by 20 percent.

Figure 2. Percentage of women with no education among respondents to WFS individual and household surveys and DHS surveys, by age at the time of the DHS survey



Note: Data are for all women, except for Peru, which is based on ever-married women only. The WFS household data are plotted at 10 years more than the age at interview.

Source: **WFS household data**—Y. Zoughlami and D. Allsopp, *The Demographic Characteristics of Household Populations, Revised Edition*, Comparative Studies, No. 45, World Fertility Survey/International Statistical Institute, Voorburg, the Netherlands, 1985.

dren per woman, compared with TFRs of 1–3 among women with a secondary or higher education (except in Peru).

However, in Colombia, the Dominican Republic and Ecuador, educational differentials in fertility narrowed between the WFS and the DHS. By the time of the DHS, the TFR in these three countries had declined by 1.0–1.7 children among women with no education or only primary schooling, while among women with a secondary education there was little or no further decline beyond the already low levels seen in the WFS.* In Peru, on the other hand, the fertility of uneducated women remained above seven children per woman, and the fertility differential between education groups was, if anything, slightly larger in the DHS than in the WFS.

In Colombia and the Dominican Republic, the educational differential in contraceptive use decreased substantially because of the much larger growth in contraceptive prevalence among women with little or no education. Although DHS data reveal that the educational differential in current use is still large, the contrast between the extreme education groups has diminished from 45 percentage points to 22 points in Colombia and from 37 to 19 points in the Dominican Republic. In Ecuador and Peru, however, the size of the educational differential in use-levels has been approximately maintained, even though current use rose consistently between the two surveys. In the latter two countries, contraceptive prevalence among women with no education has remained less than 20 percent, whereas it rose to over 60 percent among women with 10 or more years of schooling. In Ecuador, the large decline in TFR among uneducated women is not consistent with the small change in contraceptive prevalence among those women. In general, however, the education subgroups that experienced relatively large decreases in fertility also experienced large changes in contraceptive use.

Overall differentials by education in the proportion of a woman's reproductive years spent with a young child are large, as can be seen in the third panel of Table 2. At current fertility levels, uneducated women in all four countries spend nearly twice as much time, on average, caring for a young child as do those with 10 or more years of schooling. Within education subgroups, there has been remarkably little decline since the WFS in this measure, except among those with three or fewer years of education; the result has been only a small decrease in the size of the education differential, except in Peru, where the gap widened slightly.

At the ages when the proportion of women with a young child is highest (usually 25–29 or 30–34), at least 80 percent of women with no education have a child under six; this percentage rarely rises as high as 60 percent among women with 10 or more years of schooling (not shown). Within education subgroups, these peak levels showed little or no decline between the WFS and the DHS, although for the sample as a whole, there was usually some decline within the peak age-groups (Table 3). Decreases in the percentage of women with a young child were generally greatest at ages over 35. This pattern contrasts with those seen in changes in age-specific fertility rates, which generally declined greatly in the age-groups between 20 and 45. In Colombia and Ecuador, these declines were, in absolute terms, nearly as large at the ages of peak fertility as at ages 30–39, although the percentage decline was greatest among older women. Presumably, the decline in age-specific rates among younger women has had an impact on the need for child care, but its main effect in the earlier reproductive years may have been to reduce the proportion of women who have two or more young children to care for at the same time.

Highly educated women tend to remain single longer than women with less education; when the extreme education groups shown in Table 2 are compared, we see that educated women can expect to have been single for 5–8 years longer by age 50 than is typical for women with no education. Although the educational differential in this aspect of marriage did not change in a consistent manner between the WFS and DHS, it is notable that in all four countries, there was a trend toward earlier or more universal marriage within most education groups.

The size of educational differentials in

*Trends in the TFR among Colombian and Dominican women with a postsecondary education should not be taken at face value because the WFS rates were based on fewer than 100 women.

fertility preferences (see Table 2) depends on which indicator is examined. The two purely attitudinal measures shown in the table—the desire to stop childbearing and the personal ideal (or preferred) family size—suggest that educational differentials in fertility preferences are rather small. A third indicator, the "wanted TFR," gives the contrary impression (not shown). All three measures will be discussed here, although trends can be examined only for the first two measures because a comparable wanted TFR is not available by education from the WFS. However, even though the main focus of this article is on trends, to omit entirely the third measure of preferences would leave the impression that the evidence pertaining to preferences is more straightforward than is genuinely the case.

Once current family size is taken into account, desire to stop childbearing varied only slightly by education in both surveys.* Between surveys, both desire and (in most cases) the preferred number of children changed substantially for all education subgroups. Declines in the preferred number of children were greatest among uneducated women, yet at both times, educational differences in the preferred number were much smaller than differences in actual fertility rates. Among women with no education or only primary schooling, the TFR substantially exceeded the preferred number of children; among those with a secondary or university schooling, the TFR was close to (and sometimes below) the reported ideal number of children.

The TFR can be divided into "wanted" and "unwanted" portions. Here, the unwanted portion comprises the births about which the mother reported, at the time she became pregnant, that she did not want to have any more children; the wanted TFR comprises all other births, including births that were wanted later than they actually occurred. Figure 3 (page 12) shows educational differences in wanted and unwanted components of the TFR and, for the sake of comparison, educational differences in ideal family size. Both the unwanted and the wanted TFRs are substantially higher among the uneducated than among the highly educated, although unwanted fertility has not been eliminated even among the latter. In Peru, the unwanted TFR was 0.7 births per woman among those with a secondary education and 0.5 births per woman among those with a higher education.

It is also noteworthy that among the uneducated women, wanted TFRs exceed the number of children the women reported as ideal for themselves, while among the highly educated, wanted TFRs consistently fall below the personal ideal. Since the TFR is a period measure (based on fertility behavior over the previous five years only), the finding does not necessarily mean that highly educated women will in the end fall short of their preferred family size; they may merely have postponed wanted births, with the wanted TFR thus being misleadingly low. However, the independent appearance of this pattern in all four countries must raise the suspicion that the result is not purely a reflection of changing birth timing, coincidentally affecting rates for the period immediately before the surveys.

Apart from the period effect just mentioned, a number of factors might cause the wanted TFR to differ substantially from the average ideal family size within an education group. The following two hypothesized effects could contribute to this differential.

First, some women may choose not to have children they would have desired had their marital and other social and economic circumstances been more favorable.† This option is open more to women in certain subgroups, such as the highly educated, in which successful use of birth control is well established. Groups that do not practice contraception can be expected to have not only a larger number of unwanted births but also many births that occur sooner than desired. Mistimed births are in fact common in these countries: Overall, children wanted later than when they were born made up between 22 and 35 percent of births in the year before the DHS surveys.[16] It has been proposed that once fertility control is well established, many such births may never occur; for some women, the favorable circumstances that would lead to a planned birth might never materialize.[17] In this way, wanted TFRs could fall below the personal ideal number of children, and the dependence of this mechanism on successful contraceptive practice could explain the existence of larger education differentials in

Table 3. Percentage of currently married women aged 15–49 with a child under six, and fertility rate, by age-group, according to country and survey

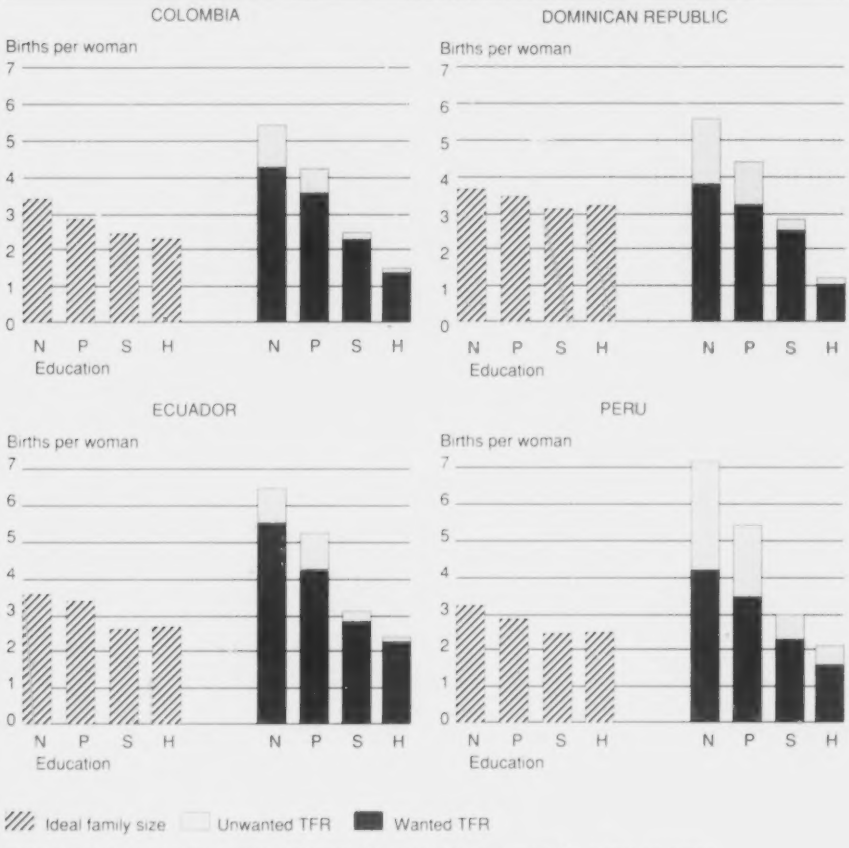
Age-group	Colombia			Dominican Republic			Ecuador			Peru		
	WFS	DHS	% diff.	WFS	DHS	% diff.	WFS	DHS	% diff.	WFS	DHS	% diff.
% of women with a child under six												
15–19	11	10	0	15	13	–7	13	13	0	10	10	0
20–24	53	49	–8	58	51	–12	54	52	–4	46	46	0
25–29	67	64	–4	72	67	–8	72	72	–1	69	69	0
30–34	65	59	–8	70	59	–16	70	67	–6	73	67	–8
35–39	51	43	–14	59	39	–36	60	51	–15	64	56	–14
40–44	38	25	–32	35	24	–31	45	36	–20	48	38	–21
45–49	19	11	–42	17	13	–24	20	19	–5	22	24	9
Fertility rates (per 1,000) over 5 yrs. preceding the survey												
15–19	101	78	–22	123	104	–15	103	91	–12	84	83	–1
20–24	230	181	–21	286	212	–26	237	216	–9	237	198	–16
25–29	221	171	–23	265	197	–26	262	213	–19	262	208	–21
30–34	172	121	–30	233	128	–45	200	153	–24	242	178	–26
35–39	130	79	–39	166	80	–52	161	109	–32	171	135	–21
40–44	62	30	–52	54	35	–35	83	62	–25	92	70	–24
45–49	23	9	–61	15	7	–53	17	23	35	26	19	–27

Sources: See reference 16; and special tabulations.

*For both surveys and for all four countries, the education-specific percentages of women who wanted no more children (or were sterilized) were adjusted for differences in the number of living children (including current pregnancies), using the family-size distribution of the Colombia DHS data as a standard. The adjustment procedure, which was based on coefficients from multiple classification analysis, produced results very similar to those of direct standardization, but had the additional advantage for the components-of-difference analysis that the education-weighted, adjusted percentages are consistent with the overall mean proportion wanting no more children, standardized on the Colombia DHS family-size distribution (which is shown in Table 1).

†Some women are also physically unable to have all the children they would like to have. While this will tend to make the wanted TFR lower than the average personal ideal number of children, it is not obvious that this effect would show a sharp differential by education, which is the primary concern of this discussion.

Figure 3. Education differences in ideal family size, wanted TFR and unwanted TFR, DHS data



Note: N = no education; P = primary education; S = secondary education; H = higher education
Sources: see reference 16.

wanted TFR than in purely attitudinal measures.

Second, both wanted TFR and personal ideal family size may be subject to an upward bias because some women are unwilling to state that they would have preferred fewer children than they have. However, this pressure might be less for the question regarding ideal size, which was deliberately phrased in a hypothetical fashion ("If you could go back to the time you did not have any children . . ."). In contrast, to divide the TFR into wanted and unwanted portions requires information on the woman's desire for each specific birth over the preceding five years. A bias against stating that births were unwanted would lead to an overestimation of women's wanted TFR and an underestimation of their unwanted TFR, with the greatest impact occurring among those who control fertility the least (such as the uneducated). Thus, an unwillingness to label specific births as unwanted might result in the appearance of a greater educational difference in wanted fertility than is actually the case.

Although we cannot at present be certain of the reasons for the different patterns exhibited by the three indicators of fertility preferences, we should note that there is no disagreement between the measures about whether fertility is currently higher than women prefer: The data for both ideal size and wanted TFR indicate that the level of unwanted fertility remains substantial among women with little or no education.

*$(R_{t2} - R_{t1}) = (\sum DR\,Ed_{t1}) + (\sum R_{t1}\,DEd) + (\sum DR\,DEd)$, where R_t is the rate or proportion for education group i at time t (t = WFS or DHS), Ed_{it} is the proportion of the population in education group i at time t (with $\sum Ed_{it} = 1$), DR is equal to $R_{i2} - R_{i1}$, and DEd equals $Ed_{i2} - Ed_{i1}$. For the synthetic-cohort measures (i.e., TFR, number of years spent single and percentage of reproductive years spent with a child under six), this calculation was performed for each age-group and the results were aggregated over age, following the general procedure for calculating each indicator.

Contribution to Fertility Change

When educational attainment increases, a decline in aggregate fertility can be anticipated, even if behavior within education groups is unaltered, because of the decrease in the proportion of the population with the least education, who have the highest fertility. For fertility and many other variables, this direct effect of changing educational composition sets a lower limit to the change that can reasonably be expected over the decade between the WFS and the DHS. Yet it is not immediately obvious how important this compositional effect has been, or how heavily the fertility decline has depended on changing behavior within educational groups. At the end of the demographic transition, lower fertility is expected in all social strata, even though fertility differentials may persist.

The separate effects of changing educational composition of the population and changing rates within education categories can be quantified through the components-of-difference technique, an extension of direct standardization. In Table 4, the total amount of change between the WFS and the DHS in several rates and proportions is broken into three parts—the rates component, the education component and the interaction component:*

- The change "due to rates" is the amount of change that would have occurred, given the actual changes in education-specific rates, if the education distribution had remained as it was in the WFS.
- The change "due to education" is the amount of change that would have occurred, given the actual changes in educational distribution between the surveys, if the rates within education categories had remained as they were in the WFS.
- The interaction column in Table 4 represents the difference between the total change that actually occurred and the sum of the two other components. The interaction term is zero if education-specific rates changed by the same amount in every education group, while a large interaction term signals that the change across groups was far from equal. In this table, the sign of the interaction term is usually opposite that of the rates component, because the greatest amount of change has taken place within the lowest education groups, which became less predominant over time. The interaction term is usually by far the smallest component, although exceptions can occur when within-category changes in rates vary greatly in size or when these changes are erratic.

The observed change in the distribution of women by education would in most

cases have led to a substantial change in fertility and the other variables considered, even if education-specific rates had remained constant. As can be seen in Table 4, distributional changes alone would have both decreased the TFR by 0.5–0.8 children per woman (anywhere from 40 to 67 percent as large as the changes that actually occurred) and decreased the percentage of reproductive years spent caring for a young child by 3–6 percentage points (equivalent to approximately 1–2 years). Except in Peru, the "rates" component of change in the TFR is larger than the education component. Changes in rates within education groups alone would have produced a decline of between 0.3 and 1.4 children per woman.

Improvements in overall education alone would have raised contraceptive prevalence by 4–7 percentage points; changes in education-specific contraceptive prevalence rates, on the other hand, would have produced an increase of 7–8 percentage points in Ecuador and Peru and 16–20 points in Colombia and the Dominican Republic, even if the overall educational level had not increased. The latter changes amount to 73–90 percent of the observed change, except that in Peru the increase in contraceptive practice within educational groups was relatively modest, while the growth in educational attainment was the greatest among the four countries. Improved educational attainment in Peru accounted for about half of the overall rise in prevalence.

As was noted earlier, the decline in the percentage of a woman's reproductive years spent with a young child was less pronounced, proportionately, than was the decline in the TFR. Increased education typically contributed more to the overall change than did changes within education categories in the proportion of time spent with a child younger than six. Although, as was shown in Table 2, there was actually a small net increase within education categories in the amount of time that Peruvian women spent raising a young child, the time so spent by the population as a whole declined modestly (by three percentage points), because the effect of increased education more than compensated for the change in rates within subgroups.

Except in the Dominican Republic, there was little change in the timing of marriage, as measured by the expected number of years spent single (shown in Tables 2 and 4). Considering only the increase in education, the expected amount of change in time spent single amounts to between 0.6 years (in Ecuador) and 1.8 years (in the Dominican Republic). In every case, the actual amount of the increase was smaller than would have been expected from the observed improvement in education; that is, there was a modest trend toward earlier or more nearly universal marriage within most education groups (see Table 2), enough to decrease the amount of time spent single by 0.5–1.5 years, if the educational distribution had remained constant.

The percentage of women intending to stop childbearing increased by 14–18 percentage points between the surveys, after introduction of controls for current family size. Almost all of this change occurred within education subgroups: The changing educational distribution can account for only about one percentage point of the overall increase. The decline in preferred family size expected from a change in the educational distribution is also small (only 0.1–0.2 children per woman); in contrast, a decline in the TFR of 0.5–0.8 children per woman can be attributed to increases in education alone. Since educational differentials in these two measures of preferences are small, even the pronounced increase in educational attainment that has occurred in these countries has not had much influence on fertility desires.

For all the variables considered, the amount of variation expected as a result of

Table 4. Change in selected rates and percentages between WFS and DHS, and degree to which such change is related to shifts in the educational composition of the population or to shifts in rates within education groups, by country

Variable and country	Survey			Change due to:			% of change due to:			
	WFS	DHS	Abs. change	Rates	Education	Interaction	Rates	Education	Interaction	Total
TFR (for five years preceding survey)										
Colombia	4.7	3.3	−1.4	−1.0	−0.6	0.1	69	40	−9	100
Dom. Rep.	5.7	3.8	−1.9	−1.4	−0.8	0.4	76	44	−20	100
Ecuador	5.3	4.3	−1.0	−0.7	−0.5	0.1	67	45	−13	100
Peru	5.6	4.5	−1.1	−0.3	−0.7	0.0	29	67	4	100
% of currently married women currently using a method										
Colombia	43	65	22	20	5	−3	90	22	−11	100
Dom. Rep.	32	50	18	16	6	−3	88	31	−19	100
Ecuador	34	44	11	8	4	−1	73	36	−10	100
Peru	31	46	14	7	7	0	49	49	2	100
% of reproductive years spent with a child under six*										
Colombia	43	37	−6	−3	−4	1	46	68	−13	100
Dom. Rep.	47	38	−9	−5	−6	2	56	72	−28	100
Ecuador	48	44	−4	−1	−3	1	31	87	−18	100
Peru	47	44	−3	2	−4	0	−49	137	12	100
No. of years spent single before age 50*										
Colombia	24.6	24.7	0.1	−0.9	0.8	0.2	†			
Dom. Rep.	21.0	21.9	0.9	−0.5	1.8	−0.4	−56	200	−44	100
Ecuador	23.8	22.9	−0.8	−1.5	0.6	0.1	172	−64	−7	100
Peru	24.4	24.2	−0.2	−1.2	1.0	0.0	†			
% wanting no more children‡										
Colombia	55	70	15	15	0	−1	102	3	−5	100
Dom. Rep.	46	64	18	18	1	−1	100	4	−4	100
Ecuador	48	62	14	13	1	−1	98	10	−8	100
Peru	52	68	17	16	1	0	94	7	−1	100
Mean no. of children preferred										
Colombia	3.5	2.7	−0.8	−0.7	−0.1	0.0	86	18	−4	100
Dom. Rep.	4.3	3.4	−0.9	−0.8	−0.2	0.1	91	17	−8	100
Ecuador	3.5	3.1	−0.5	−0.4	−0.1	0.0	82	27	−9	100
Peru§	3.8	2.9	−0.9	−0.8	−0.2	0.0	87	18	−5	100

*Synthetic cohort estimate. †Overall change was less than 0.5 year.

‡Standardized on the family-size distribution of the Colombia DHS survey. Base is currently married fecund women for WFS, currently married for DHS.

§Based on ever-married women.

Note: The education classification used here is 0 years, 1–3 years, 4–6 years, 7–9 years and ≥10 years, except for TFR and desired family size in Colombia, the Dominican Republic and Ecuador (which were none, primary, secondary and university) and for TFR in Peru (which was 0 years, 1–3 years, 4–6 years and ≥7 years). Because of rounding, component figures may not sum to the total.

change in the educational distribution is usually smallest for Ecuador and largest for either the Dominican Republic or Peru. The main reason is simply that the increase in educational attainment between the WFS and the DHS was smallest in Ecuador (partly because of the short period of time between surveys), while it was greatest in the Dominican Republic and Peru.

Conclusions

A woman's education exerts a strong influence on most aspects of her demographic behavior examined in this study. By the time of the DHS, the average woman of reproductive age had completed roughly seven years of schooling (except in Colombia, where women averaged six years). In all the countries, educated women marry later, have fewer children (and therefore spend fewer years caring for young children not yet of school age) and are much more likely to practice modern contraception. In all four countries, these educational differentials were extremely large in the past. Over the last 10 years, educational differentials in fertility have narrowed in Colombia, the Dominican Republic and Ecuador, as the least educated women experienced the most rapid fertility decline and the greatest increase in contraceptive use. Nonetheless, the differentials remain large, both absolutely and in comparison with differentials observed in other developing regions.

In all four of these countries, the educational attainment of adult women is increasing rapidly enough to produce an important amount of fertility decline, simply by increasing the proportion of women who have reached the higher levels of education. In an analysis of the components of difference between the two surveys, improvements in education were found to explain 40–67 percent of the decline in fertility. However, the fertility declines that have occurred within educational categories, particularly among the least educated women, have been impressive. In Colombia and the Dominican Republic, both of which had strong family planning programs during this period, 69 and 76 percent, respectively, of the decline in the TFR between the two surveys can be explained by declines within educational groups; decreases within educational groups accounted for an equally large share of the decline in Ecuador, even though the family planning program there is considered to be weak. On the other hand, in Peru, also known to have a weak program, education accounted for 29 percent of the overall change. It is clear that fertility change in Latin America is now transcending traditional economic and social class divisions.

Over the decade, women's preferred number of children has declined at all levels of education. The assessment of fertility desires and their relation to actual behavior remains a difficult matter, and different indicators of preferences lead to somewhat different conclusions. However, all available indicators show that various educational groups differ considerably less with respect to fertility preferences than with respect to actual fertility. Because of that, improvements in the educational distribution have played a relatively minor role in explaining the overall shift toward smaller family-size preferences. Other changes over the last 10 years affected the perceived costs and returns of having children, and thus have probably contributed more to the substantial decline in fertility desires. While all four countries have suffered economic setbacks in the early 1980s as a result of the global financial crisis, educational enrollment has continued to rise through the decade. Given an environment of economic stagnation and rapidly rising educational aspirations, the perceived costs of childbearing may be rising among all social classes as educational opportunities broaden. Nevertheless, despite the fertility declines that have already taken place, the gap between preferred and actual fertility continues to be very wide for the least educated.

Not every indicator examined here changed in the manner usually associated with higher status for women. Although educated women continue to marry substantially later than uneducated women, recent increases in education have not resulted in later marriage overall, except in the Dominican Republic. Indeed, within education subgroups, there is frequently an apparent trend toward earlier or more universal marriage. In addition, the reported proportion of consensual unions increased, even though such unions are less common among educated women. Furthermore, the duration of breastfeeding did not decline, and may even have increased in some countries, even though a decline would have been expected because educated women tend to breastfeed for a shorter duration.

Although in many respects the similarities among the four countries' fertility patterns and trends are more striking than the differences, Peru and Ecuador have TFRs in excess of four children per woman and rates that are 0.5–1.2 children above those in the other two countries. This is primarily because of higher fertility among the least educated women in Peru and Ecuador. Although Peruvian women average nearly seven years of schooling, women with no more than three years of schooling still represent nearly 30 percent of 15–49-year-olds; for these women, fertility rates are still in the range of 6–7 children, about twice as high as the number of children the women say they want.

Steadily rising enrollment rates guarantee that the proportions of women with lesser amounts of education will continue to decline, but poorly educated women will constitute an important part of the childbearing population for the next decade and beyond. Although a substantial degree of fertility decline can be anticipated as a result of continued improvement in the education experience of adult women, very rapid fertility declines will depend as well on changing the behavior of women in particular education subgroups, as was indicated in the components-of-difference analysis of recent change. Indeed, because the fertility levels among highly educated women are already fairly low, fertility trends among less educated women will prove crucial for determining whether a nation's fertility rate will continue to decline at the same rapid pace during the next decade as during the last. Looking toward the future, policymakers and family planning program managers must plan to meet the needs of poorly educated women, for whom unwanted births are still common.

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(Continued on page 28)

Stalls in the Fertility Decline in Costa Rica And South Korea

As of 1985, the fertility plateau in Costa Rica had lasted about 10 years. Two lulls in Korea were of minimal length, about five years each. That in Costa Rica, however, is already twice as long and may still be continuing.

By Murray Gendell

Summary

Although the total fertility rate declined considerably in Costa Rica and South Korea between 1960 and 1985, both countries experienced stalls in the decline lasting at least five years. Korea experienced two stalls—a plateauing from 1968 to 1972 and a pronounced deceleration in the pace of decline from 1976 to 1981. The Costa Rican stall (a plateau) began in 1976 and had persisted through 1985, when data were last available. The persistence of the Costa Rican plateau appears to be attributable to a desired family size that has remained fairly constant during the period in question, to a national family planning program that has deteriorated since 1976 as a result of political opposition and a lack of government support, and to a lack of improvement in the use of effective methods of contraception, most notably sterilization.

In contrast, Korea's stalls appear to be brief respites after periods of sharp fertility decline. The country is believed to have been able to resume the overall trend toward replacement fertility each time because desired family size has declined rapidly and steadily (an occurrence aided by a weakening in the historical preference for sons); because it continues to field a strong national family planning program; and because sterilization accounts for an increasing proportion of the high contraceptive prevalence level. Abortion is readily available in Korea also, whereas it is not in Costa Rica. Social, ecological and economic differences between the countries may also contribute to their differing patterns of fertility change.

Introduction

Models and projections of the fertility transition in developing countries have assumed an uninterrupted decline in fertility until a low level is reached. Researchers now recognize that this assumption is not always justified.[1] "Stalls" in fertility decline—defined by a plateauing of fertility or a sharp deceleration in the rate of fertility decline that occurs at a point well above the replacement level and that lasts for at least five years—have been observed in a number of developing countries in recent decades.[2]

The assumption of an uninterrupted decline in fertility in the face of such interruptions would clearly lead to an underestimation in the measurement of the rate of population growth, the size of the population and the proportion of young people in the population. It would be useful, therefore, to try to develop models and projections that make provision for possible stalls in fertility decline. That requires making judgments about their timing and duration, a task that is difficult to do with the information currently available. Hence, we need studies that identify when and why they begin and end.

In an earlier report, stalls in fertility decline were identified in Costa Rica and the Republic of Korea in the 1960–1980 period.[3] The total fertility rate (TFR) in Costa Rica fell swiftly between 1960 and 1975, from 7.3 births per woman to 3.8 births.[4] However, as Figure 1 (page 17) shows, it stalled thereafter. In Korea, the TFR declined from 6.0 births in 1960 to 2.7 births in 1980. During that period, the rate plateaued at around 4.3 births from 1968 to 1972 and the pace of decline decelerated sharply from 1976 to 1980, when the TFR crept down from 3.1 births to 2.7 births.[5] Data up to 1980 indicate that stalls of no more than five years occurred in these two countries.

Subsequent data for the 1981–1985 period, however, show that the stall continued for at least 10 years in Costa Rica. It is difficult to shrug off a plateau lasting a decade as a temporary respite after a sharp fertility decline. These data also reveal that South Korea's rapid fertility decline experienced not one but two interruptions on its way to replacement level fertility; both were considerably shorter than the one in Costa Rica. What accounts for the substantial difference in the duration of the stalls in these two countries? This article attempts to answer that question by exploring three possible reasons:

- Korea managed to lower its desired family size more than Costa Rica, thus preventing an early convergence between actual and desired fertility.
- The national family planning program in Costa Rica deteriorated during the course of the stall, thus prolonging it, while the program in Korea was improved, at least partly as a result of its stalls.
- Contraceptive prevalence and effectiveness of the methods used improved more in Korea than in Costa Rica.

The data used in calculating the trends presented in this article vary in source, nature and quality. In brief, the Costa Rican data are based on censuses and on vital statistics, both of which are regarded as reliable. Korean data are somewhat more problematic. Vital registration data have not been adequate, at least until very recently, so census and survey data are used. Problems of comparability, underreporting and fluctuations arising from small sample sizes may result in minor differences among the various estimates derived from these sources.

Desired Family Size

• *Costa Rica.* Desired family size apparently changed little in Costa Rica between the late 1960s and 1976,[6] while the TFR fell by about two children per woman. Table 1 (page 16) presents the trends between 1976 and 1986 in two measures—mean desired family size and wanted TFR. The latter is analogous to the TFR except that the numerator of the age-specific birthrate is lim-

Murray Gendell is professor of demography with the Department of Demography, Georgetown University, Washington, D.C.

Table 1. Measures of fertility preference, Costa Rica, selected years

Measure	1976	1981	1986
Mean desired family size*	4.7	4.6	4.3
Total fertility rate†	3.5	3.7	3.6
Wanted total fertility rate‡	2.6	2.8	2.7
Fertility deficit (line 1–line 2)	1.2	0.9	0.7
Fertility excess (line 2–line 3)	0.9	0.9	0.9

*Women aged 15–49 in a union. Equals number of additional children wanted plus the number of living children. Those who said they wanted no more children or were unable to have more were asked how many they would have liked to have.

†All women aged 15–49. Year breakdowns are 1974–1975, 1979–1980 and 1984–1985.

‡All women aged 15–49. This measure is constructed like the TFR except that the numerator of the age-specific birthrate is limited to wanted births.

Sources: **Desired family size**—1976: estimated for those aged 15–49 from L. Rosero-Bixby, *Fecundidad y Anticoncepción en Costa Rica 1981: Resultados de la Segunda Encuesta de Prevalencia Anticonceptiva*, Costa Rican Demographic Association and Westinghouse Health Systems, Columbia, Md., 1981, Table 24; 1981 and 1986: see reference 13, Table 6.4. **Total fertility rate**—1976: see reference 7, Table 2; 1981: calculated from L. Rosero-Bixby (see above), Table 13; 1986: see reference 13, Table 5.6. **Wanted total fertility rate**—1976: see reference 7, Table 2; 1981: calculated from L. Rosero-Bixby (see above), Tables 7, 13, 20 and 43; 1986: see reference 13, Tables 3.2, 4.7, 5.6 and 6.1.

ited to the number of births that women classified as wanted rather than the total number of births.[7] Between 1976 and 1986, the wanted TFR hovered around 2.7.* Desired family size was stable at about 4.6 during the late 1970s, and then apparently declined a little during the early 1980s. Overall, only a slight change, if any, occurred in reproductive preferences.

The difference between the TFR and the wanted TFR indicates that actual fertility exceeded desired fertility by almost one child between 1976 and 1986; thus, the potential for a further decline in the TFR, as measured by this difference, remained constant during the interval. However, the mean desired family size exceeded the TFR during this time period by notably decreasing amounts.† Nonetheless, the wanted TFR provides a better estimate of desired fertility than the usual measure of desired family size;[8] thus, it seems more reasonable to believe that fertility was excessive rather than deficient and to give more credence to the stability of the fertility excess than to the declining fertility deficit. We conclude, therefore, that there was no further convergence between actual and desired fertility after 1976.

• *Korea.* The wanted TFR in Korea cannot contribute much to this analysis because estimates are unavailable for more than one date.‡ The main available measures of reproductive preference from which trends may be discerned are ideal family size; the percentage wanting no more children; and, because of its importance in Korea, son preference. Table 2 shows a steady decline in ideal family size, from about four children per woman in 1967 to half that in 1985.§ Ideal family size provides only a rough approximation of the level of desired family size. However, unless it can be shown that whatever bias is contained in the measure changed substantially over time, these data provide a valid indication of a large decline in desired family size among women in Korea. Moreover, the decline was swift, occurring within 20 years. This is worth noting, because reproductive motivation is usually said to change very slowly.[9]

The next set of data bolsters the contention that a large, rapid decline in desired family size took place in recent decades in Korea. The percentage of married women of reproductive age who did not want more children increased steadily and rapidly between 1968 and 1985, as shown in Table 2. In addition, the increase was much greater proportionately among women who had one or two children than among those with three or four. The proportion of the latter was already fairly large as early as 1967, an indication of the strength of the potential demand for contraceptives only a few years after the establishment of Korea's national family planning program in 1961.

Finally, son preference has historically been very strong in Korea, but there is evidence that it weakened considerably in recent years. In 1976, 61 percent of respondents said that they "must have a son," 11 percent said "a son is better than a daughter" and 28 percent said they would be "satisfied with a daughter even if they had no son." In contrast, 34 percent of 1985 survey respondents said that they had to have a son, while 23 percent preferred a son to a daughter and 43 percent would be satisfied with a daughter.[10]

Table 2. Average number of children considered ideal; and percentage of women of reproductive age who want no more children, by number of living children; Republic of Korea, selected years

Year	Ideal no.	% wanting no more, by no. of living children			
		1	2	3	4
1967	3.9	7	15	55	74
1968	3.9	8	24	54	73
1973	3.1	11	46	73	85
1974	3.0	13	66	86	92
1976	2.7	19	69	88	93
1979	2.7	26	78	93	97
1985	2.0	45	92	98	99*

*Four or more.

Note: The characteristics of the women of reproductive age on whom the above data are based may differ from one survey to the next. Calculations from the Korean National Fertility Survey (1974), for instance, are based on currently married fecund women. Other surveys, however, may be based on all currently married women.

Sources: **Ideal number of children**—1967–1978: see reference 36, Table 21; 1979–1985: N.-H. Cho, 1986 (see reference 28), Table 3. **Women who want no more children**—1967–1979: see reference 36, Table 22; 1985: see reference 28, Table 4.

During the 1960–1985 period, the TFR in Korea dropped precipitously from six children to just over two children. Desired family size also apparently declined. Even if occasional lulls in the decline of desired family size caused convergences between actual and desired fertility, the resulting stalls in the TFR decline clearly did not last long.

Family Planning Programs

• *Costa Rica.* A strong national family planning program existed in Costa Rica in 1972, but by 1982, it was judged to be weak.[11] The annual number of consultations provided by the family planning program increased rapidly from 27,000 in 1968, when the program was established, to 235,000 in 1976. Then the number declined slightly and leveled off at around 225,000 until 1980, the last year for which data are available. Similarly, the number of new users served by the program rose from almost 10,000 in 1968 to 31,000 in 1976, before declining to 20,000 in 1980. Some research then shows a modest increase in users—not all of whom may have been new—to 23,000 in 1981 and 22,000 in 1982.[12]

Sterilizations are not provided by the family planning program but by the Costa

*There were differences, however, among the surveys in how wanted TFR was measured. Data for 1976 are based on whether or not the last child born in the 24 months preceding the survey was wanted. Data for 1981 and 1986 are based on whether or not the respondents wanted (more) children. A question was asked in each of these surveys on the wantedness of the last child, but these data were not presented by the respondent's age. Also, the 1981 data included those who had been sterilized, but the 1986 data did not. What effect these differences have on the comparability of the data is unclear.

†Desired family size is measured among survey respondents in a union while the TFR refers to all respondents, but there was little intersurvey variation in the percentage of respondents in a union.

‡Robert Lightbourne estimated the TFR at 3.9 and the wanted TFR at 2.5 in 1974 (see: reference 7). Thus, the fertility excess was presumably 1.4, but Lightbourne contended that the excess was underestimated because the wanted TFR had been biased upward.

§Prior to 1960, ideal family size was about five (see reference 36, Table 21).

Rican Social Security Institute, and legally, are performed only for medical reasons. However, the procedure became increasingly popular up to 1975, when considerable political opposition led to increased restrictions on its use. Initially, the number of sterilizations declined considerably, but within a few years, rose again to another peak in 1981–1982. Renewed opposition resulted in another decline through 1985, the latest date of available information.[13]

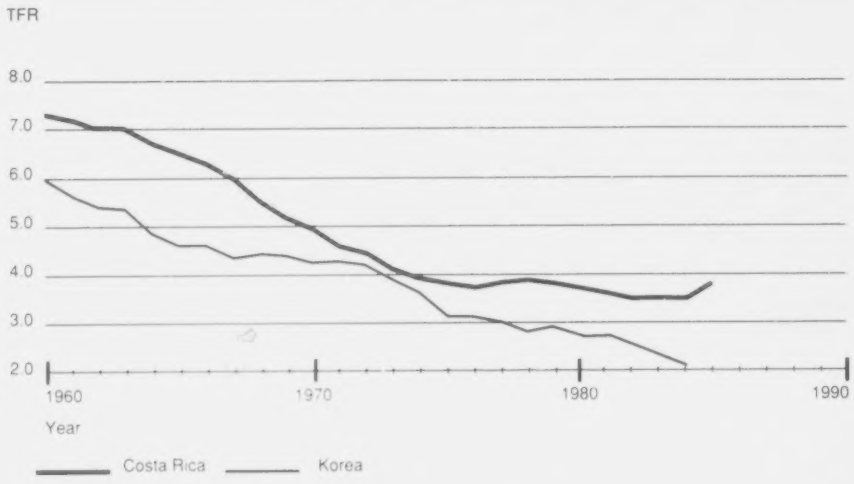
Moreover, complaints about the harmful side effects of some contraceptives led to a court judgment against the family planning program on the grounds that the IUD was an abortifacient. The Supreme Court finally dismissed the case, but as in the controversy over sterilization, the publicity likely raised or reinforced doubts about the use of modern contraceptives.[14]

More importantly, a new, more conservative government, which took office in 1978, modified family planning policy. The National Population Council was replaced by a six-member interministerial organization, the National Commission for Population Policies. Only one member of the commission seemed concerned with population issues, and at least one member was considered pronatalist. The commission recognized family planning as a right, independent of any demographic objectives that might be sought, but otherwise did little.[15] For example, the national family planning program did not make extensive use of the media or mount any major promotional campaigns regarding population. This omission was striking, according to one report, because "Costa Rican authorities believe in government by exhortation," and the country is full of "signs and posters designed to increase civic responsibility and encourage proper behavior."[16]

Summarizing the shortcomings of the national family planning program in the late 1970s, one author observed that "it is not part of an official policy to reduce births, it has not been encouraged by the principal leaders of the country, it does not offer abortion or sterilization, it does not conduct follow-up activities in the home, and the work of training and motivating medical personnel has lost its initial impulse."[17]

The report on the 1986 Demographic and Health Survey refers to the important problems confronting the national family planning program. It notes difficulties in the distribution of contraceptives, especially the Copper T IUD, and in the effort to integrate the services provided by the social security system with those of the Ministry of Health. (The existing arrangement calls for the social security clinics to provide medical consultations and the Ministry of Health to implement the advice supplied in the consultations.) In addition, the report emphasizes that the strenuous efforts of the Costa Rican Demographic Association, a nongovernmental organization, to keep the national family planning program from deteriorating has not received the "interest and necessary support of the Public Sector."[18]

Figure 1. Total fertility rate (TFR) in Costa Rica and Korea, 1960–1985



Sources: **Costa Rica**—1960–1980: L. Rosero-Bixby, 1983 (see reference 30), p. 118; 1981–1985: see reference 13, Table 5.7. **Korea**—1960–1980: see reference 36, Table 6; 1981 and 1984: see reference 28, Table 7.

One may reasonably conclude, therefore, that the government's support of the national family planning program was considerably weaker after 1976 than it was between the program's establishment in 1968 and 1976. Nonetheless, contraceptive prevalence remained at the peak it had reached in 1976, and one wonders how it did so. One possibility is that the private sector's share of contraceptive services expanded. A 1978 survey of women aged 15–44 currently in a union showed that 57 percent of contraceptive users got their method from the government program and 28 percent got it from a private doctor or pharmacy; the remainder used a method such as withdrawal or rhythm that required no source of supplies.[19] In contrast, the Costa Rican government reported in 1984 that among women aged 15–44 currently in a union, only 41 percent of contraceptive users got their method from the public sector, and 59 percent, from the private sector.[20] Whether these data are fully comparable is unclear, but the figures suggest a decline in the public sector.

Another question raised by the weakening of government support is whether there was an increase in the unmet need for contraception. Women with an unmet need for contraception are those exposed to the risk of pregnancy—that is, those in unions, fecund (including the contraceptively sterilized) and not pregnant—who want no more children but are not using an effective contraceptive method. Calculations from data for 1976[21] and 1986[22] seem to indicate an increase in unmet need from 12 percent of exposed women to 17 percent.* Each of the three factors that determine unmet need increased between 1976 and 1986: The proportion of women of reproductive age who are exposed to the risk of pregnancy rose from 82 percent of the sample in 1976 to 84 percent in 1986; the proportion of the exposed who want no more children rose from 52 percent to 60 percent; and the proportion not using effective contraceptives among exposed women who want no more children increased from 29 percent to 33 percent.

The estimates of 12 percent and 17 percent measure only the unmet need for

*Calculations are based on survey samples of women aged 20–49 and in a union in 1976 and aged 15–49 and in a union in 1986. Whether the difference in reproductive age for the two years affects the results is difficult to judge. The inclusion of teenagers would tend to reduce the relative number of those contraceptively sterilized, but it might also increase the relative number of those fecund and pregnant. Calculations of unmet need in both years are limited to women who used effective methods (i.e., the pill, injectables, IUDs, condoms, diaphragms, spermicides and sterilization), because that is all the published data for 1986 permit.

Table 3. Percentage of women in a union aged 15–49 practicing contraception, by method, Costa Rica, selected years

Method	1976	1981	1986
All methods	**67**	**65**	**69**
Sterilization (male and female)	16	18	17
Pill, IUD, injectables	30	28	28
Condom, vaginal methods	11	10	13
Rhythm, Billings method, withdrawal, folk methods	10	9	11

Source: See reference 13, Table 4.5.

contraception to limit births and do not measure unmet need associated with spacing births. Surveys conducted in 1981 and 1986 indicate that unmet need for contraception for spacing births may be much greater than that for limiting births. Among women in unions who had had a pregnancy during the five years preceding the surveys, 37 percent in 1981 and 40 percent in 1986 said that their last pregnancy was not wanted.[23] In each year, 65 percent of those who had had an unwanted pregnancy said that the unwanted pregnancy was mistimed, and 35 percent said that they had wanted no more children. In this analysis, the relevant issue is the trend, not the level, of unmet need, and the identical proportions in each year indicate no change in unmet need related to spacing between 1981 and 1986. What happened between 1976 and 1981 is not evident.

We conclude that the performance of Costa Rica's national family planning program deteriorated after 1976, mainly (if not solely) because of weaker government support. That levels of contraceptive prevalence and use of effective contraceptives did not change after 1976 suggests that the private sector compensated for the decline in service provided by the public sector, and data support this suggestion. But the compensation was apparently not enough to prevent an increase in the unmet need for contraception to limit births between 1976 and 1986.

• *Korea.* An analysis of Korea's family planning program found it to be strong in both 1972 and 1982.[24] In fact, based on a scoring system developed by the researchers, Korea received a score second only to that given China's family planning program. Because there are major differences in the 1972 and 1982 measures of program effort, scores for the two years are not directly comparable, so whether the program had gotten stronger or was less so could not be determined.

Despite its high rating, the program was far from perfect, and its major shortcomings through the early 1970s have been described elsewhere.[25] Nonetheless, the goal of the family planning program from the outset was to reduce the rate of population growth in order to accelerate economic development. This goal has been restated in the country's successive five-year plans, and the program has continually assessed its performance and made major changes to meet the targets for a declining rate of population growth. A summary of this evolution follows.[26]

In the development of Korea's family planning program, the first half of the 1960s has been called the "clinical era," because most programs were clinically oriented. During this period, there was no substructure below the Gun (county) level for providing contraceptive services and information. Family planning programs played a passive role, as clients had to come to program centers.

The second half of the 1960s is called the "field era," and program structure expanded to Eup (town) and Myon (township) levels. Fieldworkers were posted in every Eup, and mobile clinics were organized to take contraceptive services to remote areas. Nonetheless, it was during this period that the first of Korea's fertility stalls occurred. A demographer working with the Korean program at the time attributes the stall to budgetary and other operations problems.[27] In 1968 and 1969, the national family planning program initially received only six months of its budget, the result of a general underbudgeting affecting all sectors of the government. Although the rest of the budget was restored at midyear in both 1968 and 1969, targets for peak spring months had already been cut sharply, and the program was not able to fully recover during the remainder of the year. Other factors such as a reduction of distribution sites in Seoul because of fiscal improprieties at one or more sites may have also played a role. By 1972, better budgets, more family planning workers and more outlets put the program back on track.

The first half of the 1970s has been called the "expansion era," as existing programs increased their coverage and expanded their scope of services. The introduction of female sterilization, for example, added substantially to the program's success. The "reorientation era" arrived in the second half of the 1970s, when there was a growing awareness of the shortcomings of doing more of the same things. The second fertility stall began during this period. Policies designed to increase coverage and contraceptive effectiveness and those designed to improve public information were thought to have reached a point of rapidly diminishing return. Fresh approaches to changing fertility behavior patterns were designed that involved taxation, housing priority and tuition incentives.

The incentives introduced in the 1970s were expanded and formalized in the first half of the 1980s, which may be thought of as the era of comprehensive "incentive and disincentive systems." Programs for loans, housing, education, health care and welfare assistance that were linked to family size were consolidated and expanded.

Moreover, the family planning program has been using a slogan promoting the one-child family since 1981. Among married women aged 15–44, the approval rate for the "one is enough" slogan has increased from about 16 percent in 1982 to 48 percent in 1985.[28]

Contraceptive Prevalence

• *Costa Rica.* Following the introduction of the national family planning program and its subsequent expansion, contraceptive prevalence increased greatly during the late 1960s and early 1970s.[29] By 1976, 67 percent of reproductive-age women in a union were currently using a contraceptive, as Table 3 shows. Subsequent surveys in 1981 and 1986 showed no further significant change in prevalence. Similarly, there was a great increase up to 1976 in the use of effective methods of contraception, but none thereafter.

Another measure of contraceptive effectiveness is the extent to which pregnancies are unwanted. Unfortunately, the available data for 1976 are not comparable with the two later surveys, because of the greater explicitness in the latter's questionnaires about the difference between delaying and stopping childbearing. Consequently, we can ascertain a trend only for the 1980s, and as was noted earlier, these data reveal no change during that period in either the total incidence of unwanted pregnancies or the extent to which the pregnancies were timing or limiting failures. In sum, on the basis of this limited evidence, we conclude that there appears to have been little or no change between 1976 and 1986 in contraceptive effectiveness in Costa Rica.

Other determinants of fertility appear to have had no effect on the fertility stall. Nuptiality patterns, for example, were stable during the period in question. Among women, age at first union (legal and de facto) averaged 21–22 years from 1950 to 1980,[30] and the 1986 survey report indicated no significant change in the median age at first union between 1981 and 1986.[31] In addition, the proportion of women aged 40–49 who had never mar-

Table 4. Percentage of currently married women aged 15–44 practicing contraception, by method, Republic of Korea, selected years

Method	Year					
	'66	'71	'76	'79	'82	'85
All methods	**20**	**25**	**44**	**54**	**58**	**70**
IUD	9	7	11	10	7	7
Pill	1	7	8	7	5	4
Sterilization*	2	4	8	20	28	41
Condom	6	3	6	5	7	7
Other	2	4	11	12	10	11

*Male as well as female sterilization. The latter increased as follows: 1976—4.1, 1979—14.5, 1982—23.0, and 1985—31.6.

Note: Sum of methods does not always equal total because of rounding.

Sources: **1966–1979**—see reference 36, Tables 27 and 29. **1982–1985 and female sterilization**—see reference 28, Table 3.

ried varied only slightly, ranging from eight to 10 percent between 1976 and 1986.[32] It is generally agreed that abortion has had a negligible effect on fertility.[33]

• *Korea.* Prior to the establishment of Korea's national family planning program in 1961, contraceptive practice seems to have been negligible, as indicated by a prevalence rate among married women of reproductive age that was only nine percent in 1964.[34] It increased rapidly thereafter, however, and by 1985, it reached 70 percent, a rate comparable to that of the low-fertility industrialized countries. As Table 4 shows, the IUD and the condom were the predominant methods in the 1960s, but in the early 1970s, the pill supplanted the condom, and it and the IUD accounted for most of the prevalence rate. By 1976, the IUD and the pill had reached the peak of their popularity at levels not much higher than those of 1971; the prevalence rate of both then declined. The method that experienced the greatest rise in prevalence was sterilization (primarily female), which rose to 20 percent in 1979 and 28 percent in 1982, and then accelerated to 41 percent in 1985. Consequently, sterilization went from constituting 10 percent of contraceptive practice in 1966 to 59 percent in 1985.

Table 5. Percentage of currently married women aged 15–44 practicing contraception, by number of children, Republic of Korea, selected years

No. of children	1973	1979	1985
0	3.8	7.0	13.8
1	14.4	20.7	44.7
2	34.6	58.7	82.5
3	46.4	69.0	84.5
4	46.2	68.9	80.1
≥5	42.7	58.5	76.3

Source: see reference 28, Table 3.

There can be no doubt that contraceptive effectiveness increased along with the increase in sterilization. Throughout the period of fertility decline, in fact, not only has contraceptive prevalence and use of effective methods increased, but contraceptive practice has also been initiated at an increasingly early stage of the childbearing cycle, as the data in Table 5 show. In 1973, for example, 35 percent of married women of reproductive age with two children were using contraceptives; in comparison, 83 percent of their 1985 counterparts were doing so. Indeed, by 1985, almost half (45 percent) of women with only one child were practicing contraception.

Further light may also be shed on the lingering influence of son preference. Table 6 reveals that in 1985, women were more likely to be using a contraceptive if they had only a son than if they had only a daughter. Also, they were much more likely to be contraceptive users if they had two children, even if one was a daughter, than if they had only one child. An analysis of sterilization, however, shows that women were much more likely to be using this permanent method if they had only sons than only daughters, especially after having at least two children. Thus, though son preference has weakened, as noted previously, it was still a potent factor in 1985.

The great increase in contraceptive prevalence and the use of more effective methods was paralleled by a steep rise in the use of induced abortion. For example, 13 percent of married women had had an induced abortion in 1966 compared with 53 percent in 1985.[35] Abortion has been much more of a supplement than an alternative to contraceptive practice in Korea throughout the period of fertility decline, however, because of the great increase in the effectiveness of birth control methods.

A large rise in the age at first marriage was a major reason for the fertility decline in Korea during the 1960s, and increasing age at marriage also had a modest effect during the early 1970s. However, variations in nuptiality do not appear to have been a determinant of the interruptions in fertility decline. Among women, the singulate mean age at first marriage as calculated from census data stood at 21.5 in 1960,[36] rose to 23.7 in 1975 and to 24.1 in 1980.[37] Vital statistics data suggest no further rise in the mean age at marriage between 1980 and 1983.[38] Similar changes occurred among men, except that the singulate mean age at marriage stabilized earlier, beginning about 1975.

Table 6. Overall percentage of women practicing contraception and percentage relying on sterilization, by number and sex of children, Republic of Korea, 1985

Number and sex of children	All methods	Sterilization
1 son	51	11
1 daughter	36	6
2 sons	88	63
2 daughters	64	22
1 son and 1 daughter	86	u
3 sons	86	66
3 daughters	66	26

Notes: Source does not state the characteristics of the population to which the rate applies, but it is probably currently married women aged 15–44 years. Though the source does not say so, sterilizations are very likely included in the overall rate; u= unavailable.

Source: see reference 28, Table 5; and see reference 10, Table 7.

Discussion

As of 1985, the fertility plateau in Costa Rica had lasted about 10 years. In Korea, however, the plateauing of the TFR that began in 1968 lasted five years, and the deceleration in the rate of decline of the TFR that began in 1976 lasted five or six years. These two lulls in Korea were of minimal length. That in Costa Rica, however, is already twice as long and may still be continuing.

The interruptions in Korea were short because desired family size continued to drop rapidly to replacement level and contraceptive prevalence and the effectiveness of the mix of methods continued to improve. In addition, the national family planning program had the support of the government and explicitly sought to achieve targeted declines in the birthrate.

In Costa Rica, however, each of these three factors fell short. Desired family size apparently changed little between the 1960s and 1976, whereas the TFR fell swiftly. Thus, the gap between actual fertility and desired family size had narrowed considerably by 1976, but then both measures leveled off, keeping any further convergence from occurring and keeping fertility well above the replacement level. A significant factor in this trend was the deterioration in the national family planning program after about 1976, because of weakening government support and opposition deriving from one or more religious, political and ideological sources.[39] Contraceptive prevalence had reached an impressive level by 1976. After that time, however, there was no further expansion in the relative importance of sterilization to contraceptive practice, and it remained much less used in Costa Rica than in Korea. Although contraceptive prevalence was

nearly as great in 1985 in Costa Rica as in Korea, the birthrate was higher in Costa Rica. The virtual absence of abortion in Costa Rica and its considerable prevalence in Korea no doubt contributed to this difference.

These three differences between Costa Rica and Korea may not be the only significant factors in determining the persistence of interruptions in their fertility decline. It is widely asserted, for example, that modernization leads to reductions in desired family size and increases in the use of birth control methods, with subsequent falls in fertility.[40] And modernization, though at a lower level in Korea in 1960 than in Costa Rica, proceeded at a swifter pace in Korea thereafter. Korea's economy, for instance, experienced increases in real per capita income averaging 6.6 percent per year during the 1960–1982 interval, as compared to only 2.8 percent in Costa Rica. Consequently, in 1982, gross national product per capita was $1,430 in Costa Rica and $1,910 in Korea.[41]

Similarly, Korea was less urban than Costa Rica in 1960; 28 percent of its population lived in urban areas versus 37 percent in Costa Rica.[42] But Korea urbanized subsequently at a rate about twice that of Costa Rica. As a result, 65 percent of Korea's population lived in urban areas in 1985, whereas 45 percent of Costa Rica's population did so.[43]

Throughout the 1960s and 1970s, the labor-force participation rate of women was about 75 percent higher in Korea than in Costa Rica, but the pace of increase in this rate was the same in both countries: Ten percent of Costa Rican women participated in the labor force in 1960 and this proportion had grown to 14 percent in 1981; the figures for Korea were 17 percent and 25 percent, respectively.[44] There was, however, a much more rapid increase in the education of women in Korea than in Costa Rica. The proportion of girls aged 12–17 enrolled in secondary school, for example, increased almost sevenfold in Korea between 1960 and 1985 (from 14 percent to 91 percent), while it merely doubled in Costa Rica (from 21 percent to 43 percent).[45]

Korea is also a much more densely settled country than Costa Rica: In 1960, Costa Rica had 24 persons per square mile and Korea had 254 persons per square mile; in 1986, densities had increased to 52 and 420, respectively.[46] Although Costa Rica's rate of population growth between 1960 and 1985 increased the country's density more swiftly than did Korea's, the latter's density was still eight times larger in 1985 than that of Costa Rica. Korea's greater density is likely to have produced a stronger sense of crowdedness, which its very rapid pace of urbanization could well have exacerbated, contributing to a greater desire to limit fertility.

While these social, demographic and economic differences between the two countries provide additional reasons for the observed differences in the general trends in fertility and family planning, they do not help account for the differences in the timing and duration of the fertility stalls. A more detailed and careful analysis of all factors involved will be needed for a definitive judgment about their significance.

A comparison of the duration of two fertility stalls obviously cannot produce any generalizations about stalls. But this comparison does suggest that the rationale and objectives of a national family planning program may be critical determinants of the duration of plateaus and decelerations. A government whose rationale is one of health and human rights is less likely than one that sets demographic targets to make efforts to reduce desired family size, and, to judge by what happened in Costa Rica after about 1975, to satisfy existing demand for birth control. Hence, a longer stall in Costa Rica than in Korea is not surprising, and similar differences in the duration of stalls could occur in other countries under similar conditions.

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Resumen

Si bien la tasa global de fecundidad decreció considerablemente entre 1960 y 1985 en Costa Rica y Corea del Sur, en ambos países se ha producido estancamientos en este descenso de por lo menos cinco años de duración. Corea lo tuvo de 1968 a 1972, al que se añadió una pronunciada reducción de la velocidad del descenso entre 1976 y 1981. El de Costa Rica comenzó en 1976 y se mantenía aún en 1985, cuando se obtuvieron los últimos datos disponibles. En este país, la persistencia del nivelación puede atribuirse al hecho de que el número ideal de hijos ha permanecido realtivamente constante durante el periodo en cuestión, al programa nacional de planificación familiar deteriorado a partir de 1976 como producto de oposición política y por falta de apoyo oficial, y a una ausencia de mejoramientos en el empleo de métodos eficientes, particularmente la esterilizacion.

Los estancamientos producidos en Corea, en cambio, parecen breves respiros tras períodos de marcada disminución de la fecundidad. Se estima que el país ha podido reanudar cada vez su tendencia general al nivel de reemplazo debido a que la cantidad de hijos considerada ideal se ha reducido en forma rápida y sostenida (a lo que ha coadyuvado un debilitamiento de la histórica preferencia por los hijos varones), a que se sigue promoviendo un firme programa nacional de planificación familiar, y a que la esterilización representa un porcentaje cada vez mayor del alto nivel de prevalencia anticonceptiva. En Corea, el aborto resulta, además, fácilmente accesible, mientras que no en Costa Rica. Es posible que las diferencias sociales, ecológicas y económicas entre ambos países contribuyan asimismo a la distinta evolución de la fecundidad en cada uno.

Résumé

Bien que l'indice synthétique de fécondité ait décliné considérablement entre 1960 et 1985 au Costa Rica et en République de Corée, les deux pays ont vu ce déclin s'immobiliser pendant des périodes d'au moins cinq ans. La République de Corée a subi deux périodes d'arrêt entre 1968 et 1972 et entre 1976 et 1981. La stagnation au Costa Rica a commencé en 1976 et a persisté jusqu'en 1985, date des dernières données disponibles. La persistence de ce plateau au Costa Rica semble être attribuable au nombre idéal d'enfants fixé à quatre ou plus pendant cette période, à un programme de planning familial qui s'est détérioré depuis 1976 du fait de l'opposition politique et du manque d'appui gouvernemental, et à un manque d'amélioration quant à l'usage des méthodes efficaces de contraception, en particulier la stérilisation.

Par contre, l'immobilisation observée en Corée ne semble consister que de deux brèves interruptions suivant des périodes pendant lesquelles la fécondité a connu une réduction frappante. A chaque crise, le pays s'est trouvé capable, paraît-il, de reprendre la tendance générale vers un taux de remplacement, du fait que la taille de la famille a décliné rapidement et de façon constante (grâce, en partie, à l'atténuement de la préférence historique pour les fils), du fait que le gouvernement continue à subventionner un programme vigoureux de planification familiale, et du fait que la stérilisation prend une place de plus en plus marqu' dans le fort taux de prévalence contraceptive. L'avortement est facilement accessible en Corée, alors qu'il ne l'est pas au Costa Rica. Les différences sociales, économiques et écologiques sont également susceptibles de contribuer aux modèles différents d'évolution démographique dans ces deux pays.

Sterilization Regret in Sri Lanka: A Retrospective Study

Regret is not associated with the amount a woman receives for undergoing sterilization. Women who had received higher payments were no more likely than those who had received lower amounts to regret having been sterilized.

By Dennis Hapugalle, Barbara Janowitz, Sharon Weir, Deborah L. Covington, Lynne Wilkens and Celene Aluvihare

Summary

A study of 817 Sri Lankan women who underwent sterilization between 1980 and 1983 indicates that 14 percent subsequently regretted their sterilization—that is, they either said they wanted to have another child or they wished they had been sterilized later or not at all. The most important determinants of regret were not having a child of each sex at the time of the operation, being married fewer than five years, being under age 25, having two children or fewer, not having control over the sterilization decision, having a husband who opposed the sterilization and having a child die subsequent to the procedure.

Introduction

In 1980, the government of Sri Lanka initiated a number of changes in its national family planning program to improve citizens' knowledge of family planning and to facilitate their access to contraceptive services. These changes included increasing funding for family planning service programs, training medical personnel to perform sterilizations, upgrading hospitals to enable them to provide sterilizations and paying medical teams a small amount for each sterilization performed—35 Rupees (Rs)* for each vasectomy and Rs 65 for each tubal ligation. In addition, the government began providing a monetary payment and leave benefits to sterilization acceptors, a policy that continues today.[1]

The program played a key role in improving access to sterilization services in Sri Lanka. In 1980, the number of sterilizations was triple that of the previous year (112,926 vs. 35,643). Further, the proportion of currently married women who had undergone sterilization increased from nine percent in 1974 to 17 percent in 1982.[2]

As Table 1 shows, the number of sterilization acceptors rose dramatically in late 1980 and early 1981, a period coinciding with the increase from Rs 100 to Rs 500 in the amount of money the government paid to men and women who underwent sterilization. The drop in the number of acceptors beginning in early 1981 coincided with a reduction in the payment to Rs 200. The number of sterilizations began to rise in January 1982, when the payment was increased to Rs 300, and grew again when the payment was increased to Rs 500 in June 1983.[3]

The issue of concern is whether the increased availability of sterilization services enabled men and women to meet a previously latent demand for sterilization, or whether the amount of money paid to acceptors influenced the decision to undergo sterilization and later resulted in regret.

According to the Population Division of the Ministry of Plan Implementation in Sri Lanka, the payment is intended to "reimburse any expenses incurred or income lost in connection with the sterilization, such as wages lost, cost of travel, food, purchase of clothing, etc., and is not in any way intended to coerce or induce a person to accept sterilization."[4] Moreover, the government has taken steps to prevent the payment from becoming a financial inducement to sterilization. People with fewer than two living children and those who are not married cannot be reimbursed for undergoing sterilization. In addition, government policy requires that prospective acceptors be informed of the irreversible nature of the procedure and counseled about other methods; medical staff must obtain the client's informed consent before performing a sterilization. Since 1980, Community Development Services (CDS) has been offering sterilizations at its family planning clinic in Colombo, the capital city, and at its mobile clinics outside of Colombo. CDS also maintains seven regional offices, through which area managers, counselors and voluntary health workers educate women about sterilization. According to its records, CDS has provided information about sterilization to over 10,000 women in areas outside Colombo. Although CDS is the largest nongovernmental provider of sterilization services, only a small proportion of all Sri Lankan sterilizations are performed in its facilities: In 1982, when its share of sterilizations was highest, CDS performed five percent of all female sterilizations, while the government provided over 90 percent.

To determine whether payments have served as a financial inducement to female sterilization and whether that inducement

Table 1. Amount of money paid to sterilization acceptors and number of sterilizations performed per month, by payment period, Sri Lanka, 1980–1985

Payment period	Payment*	No. of sterilizations
<1980	0	1,700
(1) Mar. 1980–Sept. 1980	100	3,800
(2) Oct. 1980–Jan. 1981	500	7,000
(3) Feb. 1981–Dec. 1981	200	3,100
(4) Jan. 1982–May 1983	300	4,000
(5) June 1983–Dec. 1983	500	6,000
1984	500	5,300
1985	500	4,500

*Payments are in rupees; Rs 25 = U.S. $1.

Source: Family Health Bureau, *Annual Report on Family Planning Acceptors in Sri Lanka* (various years), Ministry of Health, Colombo, Sri Lanka.

At the time this article was prepared, Dennis Hapugalle was honorary executive director, Community Development Services, Sri Lanka. Sharon Weir was senior research analyst, Barbara Janowitz was associate director and Deborah L. Covington was senior research analyst in the Program Evaluation Division of Family Health International (FHI), and Lynne Wilkens was associate biostatistician at FHI. Celene Aluvihare was managing director, Marketing Resource Ltd., Sri Lanka. Support for the study upon which this article is based was provided by FHI with funds from the U.S. Agency for International Development.

*Rs 25 = U.S. $1.

might have contributed to regret, CDS asked Family Health International for assistance in carrying out a study to identify the factors associated with long-term sterilization satisfaction and regret and, in particular, to determine whether regret is associated with the amount of payment a person receives for undergoing the procedure. In this article, we describe women's characteristics at the time of sterilization, the proportion who experienced regret, the relationship between payments and regret, and the extent to which background characteristics and poststerilization events are correlated with regret.

The Study

The study sample was drawn from the more than 16,000 women who underwent tubal ligations in a CDS facility between 1980 and 1983. It included urban women (whose sterilizations had been performed at the clinic in Colombo), rural women (whose procedures had been performed at the district hospital in Kalutara) and women living on tea estates* (whose operations had been performed at a clinic in Badulla District). Interviews with these women were carried out in 1985, 2–5 years after the sterilization procedure. We adopted a retrospective study design to compare satisfaction and regret among women at these three sites over the five time periods during which different payment levels were in force. To assess the effect of the change in money payments on regret, the investigators estimated that they would need to complete 100 interviews among women who had undergone sterilization at each of the three sites during each of the five payment periods. Because of the anticipated difficulty of finding women several years after their sterilization, we attempted to draw a sample of at least 150 women from each of the site/payment combinations.

However, services were not available at every site during all of the payment periods. The CDS Suva Sevana Clinic in Colombo began providing sterilizations in March 1981, nearly a year and a half after the government began reimbursing acceptors. Consequently, the Colombo sample was stratified by date of the operation into just three payment periods, with the three subsamples chosen from lists of women sterilized during each time period, using systematic selection with a random start.

The sterilization program began in early 1980 at the rural district hospital in Kalutara. Records of all women sterilized there were obtained by date of operation and the samples chosen by systematic selection with a random start. However, the last payment period could not be included in the analysis because the hospital suspended sterilization services when the payment level rose to Rs 500 in June 1983.

Since 1979, tea estates have supplemented government payments for sterilization, so that estate workers receive Rs 500 per procedure. The estate sample was stratified by date of the operation, even though the payment remained constant throughout the study period. Sterilization services began in Badulla District in March 1981 and terminated on June 1, 1983; consequently, only two comparable time periods are covered. Because relatively few women underwent sterilization there between March and December 1981, they all were included in the study.

The final sample consisted of 817 women, or 60 percent of the potential respondents. Response rates did not differ substantially among sites (58 percent in the rural district vs. 61 percent in Colombo and the tea estates). The goal of obtaining at least 100 completed interviews among women at each site and during each payment period was achieved in only three of the final nine site/payment combinations. However, none of the women approached for interview refused to participate in the study. In all sites, about 25 percent of those originally selected for the study were not interviewed because they had moved to another part of Sri Lanka or to the Middle East. Almost nine percent of the women could not be reached at home after three attempts had been made to interview them, and six percent were not interviewed for "other" reasons. Information about the characteristics of women who were not successfully followed up is not available.

The researchers identified factors prior to the operation, as well as outcomes or events after the procedure, that might be associated with regret. Two of these factors are economic—the amount of payment acceptors received and the level of family income. If women who would not otherwise have been sterilized were induced to undergo the procedure because of the payment, one would expect the proportion of women who regret the operation to increase with the level of the payment. Also, one might expect women with lower family incomes, for whom the reimbursement accounted for a larger percentage of income, to be more likely than others to regret sterilization.

Data were collected on the demographic characteristics of the women at the time of sterilization, including their age, their

Table 2. Percentage distribution of respondents, by various characteristics at the time of interview, according to the site of the procedure

Characteristic	All (N=817)	Colombo (N=297)	Rural district (N=351)	Tea estates (N=169)
Education (yrs.)*				
0	14.1	9.1	9.1	33.1
1–5	25.0	29.3	30.8	53.8
6–9	35.0	43.1	40.7	8.9
≥10	15.9	18.5	19.4	4.1
Ethnicity*				
Sinhalese	74.2	86.2	90.0	20.1
Indian Tamil	18.8	0.3	8.0	74.0
Sri Lankan Tamil	4.5	10.8	0.6	1.8
Sri Lankan Moor/other	2.4	2.7	1.4	4.1
Religion*				
Buddhist	70.0	76.1	88.3	21.3
Hindu	20.1	7.7	6.8	69.2
Catholic	6.9	12.8	3.1	4.7
Muslim	2.1	1.7	1.4	4.1
Other	1.0	1.7	0.6	0.6
Employment status*				
Employed	34.4	18.2	22.5	87.6
Not employed	65.6	81.8	77.5	12.4
Current monthly income*				
Rs 300	16.8	18.5	22.3	1.8
Rs 301–700	46.3	38.4	52.0	47.9
Rs 701–1,000	23.3	21.9	14.4	44.4
>Rs 1,000	12.4	17.5	11.3	5.5
Unknown	1.3	3.4	0.0	0.5
Contraceptive use*,†				
Ever used	39.2	42.4	41.9	27.8
Never used	60.8	57.6	58.1	72.2
Current marital status				
Married	98.8	99.0	98.9	98.2
Not married	1.2	1.0	1.1	1.8
Age-group†				
<25	21.9	21.9	25.3	19.1
25–29	31.5	29.6	25.6	46.2
≥30	46.6	45.1	45.2	31.9
(Mean)	(29.2)	(28.8)	(30.2)	(28.0)
No. of living children†				
1	0.6	1.0	0.3	0.6
2	20.4	20.2	14.0	34.3
3	41.4	48.1	38.7	33.7
≥4	37.7	30.7	47.0	31.4
(Mean)	(3.5)	(3.4)	(3.8)	(3.1)
Timing of sterilization*				
At delivery	27.5	12.8	47.3	12.4
1 mo. postdelivery	14.2	18.2	10.0	15.9
2–11 mos.	25.6	29.3	14.8	43.2
12–23 mos.	11.4	13.1	10.3	10.7
≥24 mos.	14.7	23.2	13.4	2.4
Unknown	6.6	4.4	4.3	15.4
Total	100.0	100.0	100.0	100.0

*Differences are statistically significant at $p<0.05$.

†At the time of sterilization.

*The tea estates are part of a highly structured employment system that depends heavily on manual labor provided by Indian families.

Table 3. Percentage of women who regretted their sterilization,* by site of the procedure, payment period and amount of payment

Site, payment period and amount of payment	%	N
Total	**14.3**	**817**
Colombo	**12.8**	**297**
(3) Rs 200	14.1	99
(4) Rs 300	10.2	98
(5) Rs 500	14.0	100
Tea estates†	**15.4**	**169**
(3) Rs 500	13.0	77
(4) Rs 500	17.4	92
Rural district	**15.1**	**351**
(1) Rs 100	13.0	46
(2) Rs 500	14.3	91
(3) Rs 200	20.6	97
(4) Rs 300	12.0	117

*In this and subsequent tables, women who wanted another child and women who wished they had been sterilized later or not at all.

†The sterilizations of women from the tea estates were subsidized by the estates at a level of Rs 500 from 1980 to 1983.

Note: None of the associations between regret and amount of payment reached statistical significance.

marital status and the number and sex of their children. A number of studies have shown these variables to be associated with sterilization regret.[5] Although it seems plausible that younger and low-parity women would be the most likely to feel regret, a review of the available research indicates no consistent association between age and regret.[6]

A wide range of other variables were examined, such as ethnicity, religion and residence. In addition, other factors were studied that measure the degree to which each woman freely made an informed choice to be sterilized—including an understanding of the irreversibility of the procedure, knowledge of reversible family planning methods and the influence of medical and family planning staff.

Because sterilization regret may be associated with events that occur after the procedure—such as poor physical or emotional adjustment to the operation, marital disruption or, perhaps most traumatic, the death of a child—respondents were also asked whether they had experienced any of these negative poststerilization events.

Characteristics of the Women

Table 2 (page 23) shows the characteristics of the women at each site at the time of interview. The profiles of the urban and the rural women were quite similar, but, not surprisingly, these women were more likely than than those from the tea estates to have had six or more years of education, to be Sinhalese rather than Indian Tamil, to be Buddhist rather than Hindu, to be unemployed and to have low family incomes.

Overall, only 39 percent of respondents had ever used a contraceptive method before undergoing sterilization. However, women from Colombo and the rural district were more likely than those from the tea estates to have done so (42 percent vs. 28 percent). Among women who had practiced contraception, the last method used varied among the sites: Women from Colombo had most commonly used oral contraceptives; those from the tea estates were most likely to have practiced periodic abstinence; and those from the rural district had most commonly used the IUD (not shown).

At the time of sterilization, the mean age among all women was 29, and their mean number of living children was 3.5. In all three sites, almost every woman was currently married. However, the women's age and family size and their age at and the timing of sterilization varied significantly among sites: At sterilization, women from the tea estates were younger and had fewer living children than women from the other two sites. Almost half (47 percent) of the sterilizations among women in the rural district occurred within one month after delivery, compared with 13 percent among women in Colombo and 12 percent among women on the tea estates.

Sterilization Regret

To get a general picture of the extent of sterilization regret and the reasons for acceptors' dissatisfaction or satisfaction with the procedure, interviewers asked respondents the following questions: "(1) If you had to make the decision over again, would you still get sterilized? Why or why not? (2) Since you were sterilized, have you changed your mind and regretted having the sterilization because you wanted to have another child? (3) Do you wish you had been sterilized sooner than you were or later, or do you regret being sterilized? Why or why not? (4) Are you satisfied with your sterilization? Why or why not? (5) Do you feel that sterilization has improved your life, has had no effect, or has made it worse?"

Overall, 15 percent of respondents indicated by their answer to at least one of the questions that they had experienced some regret about or dissatisfaction with sterilization; the proportion ranged from 14 percent of the women in Colombo to 17 percent of those on the tea estates (not shown). Of those who felt some regret, 92 percent said that they wanted more children or they wished they had been sterilized later or not at all. Five percent reported that sterilization had made their life worse or caused them dissatisfaction, but they did not regret the timing of the procedure or want to have additional children; consequently, these women were not considered to have experienced regret. Most of

Table 4. Percentage of women who regretted their sterilization, by various characteristics at the time of sterilization

Characteristic	%	N
Age-group*		
<25	28.5	179
25–29	11.3	256
30–34	10.7	243
≥35	7.9	139
No. of living children*		
0–1	†	5
2	29.3	167
3	13.4	336
4	7.0	157
≥5	5.9	152
Sex of children*		
Male and female	9.8	643
Females only	29.7	74
Males only	32.0	100
Duration of marriage (yrs.)*		
<5	33.3	123
5–9	14.5	344
≥10	6.0	298
Unknown	15.4	52
Timing of sterilization		
At delivery	11.6	225
Postdelivery		
1–3 months	6.6	199
4–11 months	15.9	126s
≥1 year	16.0	213
Unknown	13.0	54
Monthly income‡		
<Rs 300	11.9	134
Rs 301–500	12.7	244
Rs 501–700	17.2	134
Rs 701–1,000	18.3	191
>Rs 1,000	11.9	101
Education (yrs.)		
0	12.2	115
1–5	14.3	286
6–9	14.3	286
≥10	15.6	128
Ethnicity		
Sinhalese	14.5	606
Sri Lankan Tamil	5.4	37
Indian Tamil	16.9	154
Religion		
Buddhist	14.9	572
Hindu	15.9	164
Catholic	5.4	56
Other	12.0	25

*Differences are statistically significant at $p<0.05$.

†Cell size insufficient.

‡Determined at time of interview.

the participants who said they would not get sterilized if they had to make the decision again said they were too old or no longer sexually active, indicating that they had misunderstood the question.

When the category of those who regret sterilization was limited to women who responded positively to questions 2 and 3--that is, women who said they wanted to have another child (12 percent) and those who said they wished they had been sterilized later (six percent) or not at all (five percent)—14 percent of respondents fell into this category. (This is the definition of regret that will be used throughout the remainder of the article.) The desire for more children was highly correlated with regret: Of the 45 women who said they wished they had been sterilized later, 80 percent wanted more children; of the 37 who wished they had never been sterilized, 81 percent wanted more children.

The researchers performed a series of analyses to determine the extent to which economic, demographic and decision-making factors at the time of sterilization, and events that occurred later, were associated with regret.

• *Economic factors.* Table 3 shows the proportion of women who regretted their sterilization according to the site of the procedure, the payment period and the amount of payment. The results of a chi-square test indicate no statistically significant association between regret and payment amount at any site ($p = 0.66$). These results are corroborated by responses to other questions that sought to determine whether financial reasons motivated women to undergo sterilization. For example, respondents were asked whether the payment was important in their decision to be sterilized. Only 12 women said that it was an important factor.

• *Demographic and social factors.* The data from the three sites were pooled to determine whether any demographic factors present at the time of sterilization were associated with regret. Table 4 shows that younger women were significantly more likely than older women to regret having been sterilized. In fact, women under 25 at sterilization were almost four times as likely as women 35 and over to experience regret (29 percent vs. eight percent). Regret was likewise significantly associated with the number of children a woman had: Thirty percent of the women with two children regretted the sterilization, compared with only six percent of those with five or more. Women were also significantly more likely to regret having been sterilized if they did not have a child of each sex. The sex of the "missing" child, however, was not a factor in regret. Of the women who lacked a son, 30 percent regretted their decision; of those who lacked a daughter, 32 percent did. Women whose children were all of one sex were twice as likely to regret their sterilization as women with the same number of children but at least one of each sex (not shown).

Given that younger women have been married a shorter time and have fewer children than older women, it is not surprising that women married fewer than five years were more likely to report regret than those married 5–9 years and those married 10 or more years (33 percent vs. 15 percent and six percent, respectively).

Other researchers have considered the length of time that elapses between the birth of the last child and the sterilization procedure to be a possible factor in regret,[7] hypothesizing that women who undergo sterilization at the time of delivery may be more likely than those who have the operation later to regret their decision. The latter group may be physically and psychologically better prepared, less likely to undergo the procedure for economic reasons and more confident that their youngest child will survive its first year. However, among the Sri Lankan women in this study (when women who underwent sterilization within a month of delivery are assumed to have had the procedure at delivery), the timing of the sterilization appears to have had no impact on regret.

The table also shows no association between regret and respondents' family income, education, ethnicity or religion. Although Sri Lankan Tamils are less likely than Sinhalese or Indian Tamils to experience regret, the difference is not statistically significant ($p = 0.20$). Nor is there a statistically significant religious differential in levels of regret.

• *Decision-making factors.* To determine whether a woman was more likely to feel regret if someone else had made the sterilization decision for her, respondents were asked whom they considered the most influential person in their decision, and whether they felt others had tried to pressure them to undergo sterilization. As Table 5 shows, 90 percent of the women reported that they themselves had been the most influential person in their decision; the vast majority of these women did not feel that others had tried to pressure them. Eleven percent of the women said that others had been the most influential in their decision; nevertheless, these respondents were likely to report that they had not been pressured by those other people. Of the women who reported that others had had the most influence on their decision and that others had pressured them to undergo sterilization, more than half (58 percent) regretted their sterilization.

Table 5. Percentage distribution of respondents, and percentage who regretted their sterilization, by whether the woman herself or other individuals had had the most influence on the sterilization decision

Decisive influence	% of total	% who regret
Self	**89.5**	**13.1**
Pressured by others	3.3	7.4
Not pressured by others	86.2	13.5
Others	**10.5**	**24.4**
Pressured by others	2.3	57.9
Not pressured by others	8.2	14.9
Total	100.0	14.3

Women were also asked about the degree of influence that doctors, nurses, family planning workers, friends and husbands had had in the decision-making process. A doctor's advice was quite important to 42 percent of the women (see Table 6), almost twice the proportion who reported that a family planning worker's advice was important (24 percent). Even when respondents said that medical staff had had great influence on their decision, this influence was not associated with regret. Among those who reported that advice from a doctor had been important, 11 percent regretted having been sterilized; among women who had considered advice from a family planning worker important, 12 percent regretted their decision.

Women who reported that friends had strongly influenced their decision were

Table 6. Percentage of respondents who reported that another person had a great influence on their decision, and percentage of those who regretted their sterilization*

Influential in decision	% of total	% who regret
Doctor	41.6	11.2
Nurse	52.1	8.9
Family planning worker	24.4	12.1
Sterilized friend	43.6	15.2
Unsterilized friend	16.3	16.5
Husband	65.9	11.3

*Respondent could select more than one person.

Table 7. Percentage of respondents who regretted their sterilization, by number of living children at the time of sterilization and by whether any children died after the procedure

No. of children and child deaths	%	N
Any number		
Child died	48.5	33
No death	12.9	784
One		
Child died	0.0	0
No death	60.0	5
Two		
Child died	81.8	11
No death	22.3	156
Three or more		
Child died	31.8	22
No death	9.3	623

more likely to experience regret than were those who claimed that nurses, doctors or family planning workers had greatly influenced them. Perhaps friends gave these women inaccurate information or did not describe the procedure correctly.

The role of the husband in the sterilization decision and his support of or opposition to the operation are important in understanding regret. Women who said their husband had greatly influenced the decision were less likely than other women to regret sterilization. In contrast, women who had not discussed the operation with their husband and women who had discussed it but did not have their husband's support were twice as likely to regret sterilization as those whose husbands knew and approved of the decision—22 percent and 23 percent vs. 12 percent, respectively (not shown).

• *Poststerilization events.* Table 7 shows the proportion of women who regretted their decision, by the number of living children they had at the time of sterilization and whether they lost a child after undergoing the procedure. Almost half of all the women who lost a child regretted having been sterilized. Among women with two children at sterilization, 82 percent of those who subsequently lost a child regretted their decision, and among those with three children or more, 32 percent did.

Events less traumatic than the death of a child that occur after sterilization also can contribute to dissatisfaction with the procedure. Table 8 shows the proportion of women who reported a health or emotional problem that they believed was caused by the sterilization, and the proportion of those with problems who regretted the sterilization.

Almost all of the women (97 percent) attributed at least one health or emotional problem to the sterilization. Nearly 90 percent of the women reported that they were unable to work at home immediately after the surgery, probably as a consequence of physical problems arising from the surgery (not shown). The amount of time women had been unable to work at home ranged from one day to six months; however, fewer than half of the women said it had been more than a week. Respondents who said they had been unable to work at home were more likely than those who had continued working to regret the sterilization (16 percent vs. three percent). The most common physical problems reported were backaches and abdominal pain. Of those who reported physical problems, half had received treatment as outpatients. Only four percent had been treated in a hospital, one indication that the physical problems were usually not severe. One-fourth reported that their menstrual cycle became more bothersome following the sterilization (see Table 8). Almost half reported a general worsening of health since the operation; these women were more likely to regret the sterilization than those who did not report a general worsening of health (18 percent vs. 11 percent).

Table 8. Percentage of women with health, marital and emotional problems that they attributed to sterilization, percentage who regretted their sterilization because of a specific problem and percentage with no such problem who regretted their sterilization

Type of problem	% with problem	% with problem who regret	% without problem who regret
Any	**97.2**	**14.7**	**na**
Health	**96.5**	**14.4**	**10.7**
Required treatment	37.0	16.6	13.0
Did not require treatment	27.4	15.2	14.0
Menstrual cycle more bothersome	27.9	16.2	13.6
General worsening of health	45.8	18.4	10.8
Emotional or marital	**33.2**	**36.2**	**3.6**
Husband wants more children	14.9	62.3	5.9
Marital harmony disrupted	2.7	31.8	13.9
Loss of feeling feminine	5.8	12.8	14.4
Worsening of sexual relations	6.6	24.1	13.6
Other emotional problems	7.7	20.6	13.8

Note: na = not applicable.

One-third of the participants reported having an emotional or marital problem that they attributed to the sterilization. The complaint cited most often, by 15 percent of the women, was that their husband wanted more children; 62 percent of these women regretted the sterilization. With the exception of women who said they felt less feminine after the procedure, those who reported any emotional or marital problem were much more likely than those without such a problem to regret having been sterilized (36 percent vs. four percent).

Determinants of Regret

Table 9 shows the results of a logistic regression analysis estimating the odds that a person with a particular risk factor would regret having been sterilized after the effects of the other factors are controlled for. For example, women who did not have at least one son and one daughter were three times more likely to regret their sterilization than were women who had at least one child of each sex. Besides the seven variables shown, the site of the procedure and the amount of payment were also controlled for, even though there was no prior indication that these factors were associated with regret.

As the table shows, the most important determinants of sterilization regret among women in the sample were not having a child of each sex at the time of the operation, having a child die subsequent to the procedure, being married fewer than five years, having two children or fewer, having a husband who opposes sterilization or with whom it was not discussed and not having been in control of the sterilization decision. Because women under 25 are more likely than women 25 or older to have been married fewer than five years and to have fewer than three children, it is not surprising that young age was not significantly associated with regret once duration of marriage and number of children were controlled for.

Program staff most likely would benefit from being able to easily identify risk factors for regret, in order to target for additional education or counseling prior to sterilization the women with greatest potential for regretting sterilization. Therefore, the variable concerning the death of a child subsequent to the operation was removed from the regression model, since such information cannot be known at the time of sterilization. When the child mortality variable was dropped from the model, the only significant change in the odds ratios was that being under 25 became significant.

Table 10 shows the predicted probabilities of regret that have been calculated from the regression equation for the various combinations of risk factors. Of the 342 women who had none of the six risk factors, the probability of regret was four percent; among those with one risk factor, the probability of regret varied from eight to 13 percent, while among those with two risk factors, it ranged from 16 to 24 percent. The probability of regret was correspondingly higher among those with three or four risk factors.

Nevertheless, predictions of risk should not be based solely on the number of risk factors a woman has, but on the particular combination of factors. For example, the likelihood of regret is highest among women who lacked a child of each sex. All women with this risk factor may need additional counseling.

Discussion

It is difficult to quantify sterilization regret because regret can be defined in a number of ways. For example, in this study, if regret had been defined very broadly as any emotional problem attributed to the operation, one-third of the women would have been identified as regretting sterilization. On the other hand, if the definition of regret had encompassed only those women who said that they wished they had never been sterilized, fewer than five percent would have been classified as regretting sterilzation.

The phrasing of questions concerning satisfaction and regret and the interpretation of responses can be especially difficult. Many women misunderstood the question, "If you had to make the decision over again, would you still get sterilized?"—one of the "simplest"—as evidenced by their replies that they were now too old to be sterilized. Such women do not appear to regret the operation. Other participants gave contradictory responses to questions; for example, some who said they regretted having been sterilized because they wanted to have another child also said they did not regret the timing of their sterilization. For these women and others, it is difficult to distinguish regret about sterilization from regret about growing older.

In this study, the factors that were found to be associated with regret were not having a child of each sex, being married fewer than five years, having fewer than three children, being under 25 years of age, having a husband who did not support the sterilization decision and believing that others made the decision. One of the most important findings is the strong association between regret and not having a child of each sex; less surprising is the association between regret and number of living children. Over 85 percent of the women who said they regretted sterilization reported they did so because they wanted to have more children. Similarly, other investigators have found that sterilization regret in developing countries is likely to be associated with a desire for more children, whereas regret in developed countries is more likely to be associated with remarriage and the desire to have children[5] with the new husband.[6]

Perhaps the most important finding from this study for those involved with the sterilization program in Sri Lanka is that regret is not associated with the amount of the payment a woman receives for undergoing the procedure, although the payment may affect the timing of the operation. Women who had received higher payments were no more likely than those who had received lower amounts to regret having been sterilized. This finding should reassure policy-makers who have come under criticism for the possible coercive effects of the payment. The most likely explanation for the dramatic increases in voluntary sterilizations in the early 1980s in Sri Lanka is that pent-up demand for sterilization was being met by successful government and nongovernmental programs to improve access to contraceptive services.

How could Community Development Services reduce the level of regret among women obtaining sterilizations in their facilities? Counseling and education efforts targeted at those most likely to experience regret are the most cost-effective means of reducing regret. Except for four percent with "unexplained" regret, all of the women who regretted their decision to be sterilized had had at least one of the other six risk factors for regret at the time of the operation.

Counseling programs should offer information on reversible contraceptive methods, including instructions on their use, their cost and the likelihood of adverse side effects. In addition, a counselor should inform each woman of the irreversibility of the procedure, impress upon her the advantages of discussing the operation with her spouse and assess her attitude toward sterilization, her ability to accept loss and her relationship with her husband.

Finally, it should be noted that this study not only identified women who regretted not having waited to be sterilized, but also identified those who would have preferred to undergo sterilization earlier. Fifteen percent of the participants reported that they wished they had been sterilized earlier. This finding indicates the existence of an unmet demand for sterilization in Sri Lanka, and should encourage program planners to increase the availability of sterilization services.

Table 9. Odds of regretting sterilization, for women with selected risk factors

Risk factor	Odds ratio	95 percent confidence interval
Lacked child of each sex	3.3	2.0–5.3
Death of a child since sterilization	6.7	2.9–15.6
Married <5 years	2.2	1.2–4.0
Lacked control over sterilization decision*	11.0	3.7–32.6
<3 children	2.3	1.3–3.9
Lacked spousal support†	2.2	1.3–3.5
Age <25	1.6	0.9–2.8

*Includes women who said that someone besides themselves was most influential in making the sterilization decision and that the other person had persuaded them to undergo sterilization.

†Includes women who did not discuss their sterilization plans with their husbands and some who did discuss their plans but whose husbands disapproved.

Notes: Sterilization site, amount of payment and other factors were controlled for. A stepwise logistic regression model was used. Variables other than those shown above did not enter the regression because they made little additional contribution to explanation of the variance.

Table 10. Predicted probability* that women will regret their sterilization, by risk factors

Risk factor	Probability	N
None	**0.04**	**342**
One		
Age <25	0.08	36
Lacked child of each sex	0.13	51
<3 children	0.09	32
Married <5 years	0.10	15
Lacked spousal support	0.10	105
Two		
Age <25, married <5 years	0.16	21
Lacked spousal support, lacked child of each sex	0.24	13
Age <25, lacked spousal support	0.16	13
<3 children, lacked child of each sex	0.24	28
Age <25, <3 children	0.16	15
Three		
Age <25, <3 children and married <5 years	0.28	17
Age <25, <3 children and lacked child of each sex	0.36	15
Four		
Age <25, <3 children, married <5 years and lacked child of each sex	0.54	17

*Probabilities are not presented for combinations in which N totaled less than 10.

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Resumen

Un estudio de 817 sri-lankesas que se habían hecho esterilizar entre 1980 y 1983 revela que el 14 por ciento lamentaba mas tarde haberlo hecho, es decir que afirmaba desear otro hijo, o hubiera preferido esterilizarse más adelante o directamente no haberlo hecho. Los principales determinantes del arrepentimiento eran no tener un hijo de cada sexo al momento de la operación, llevar casada menos de cinco años, ser menor de 25 años, tener dos hijos o menos, no haber podido decidir libremente, que el marido se opusiera a la esterilización, o que hubiese muerto un hijo después del procedimiento.

Résumé

Une étude de 817 ceylanaises ayant été stérilisées entre 1980 et 1983 indique que 14 pour cent regrettent l'opération—c'est à dire qu'elles auraient aimé soit avoir un autre enfant, soit avoir été stérilisées ultérieurement ou pas du tout. Les principaux facteurs déterminant ce regret étaient de ne pas avoir eu un enfant de chaque sexe au moment de l'opération, d'avoir un enfant qui meurt après l'opération, d'être mariée depuis moins de cinq ans, d'avoir moins de 25 ans, d'avoir deux enfants ou moins, de ne pas avoir pu prendre la décision elle-même, et d'avoir un mari qui s'oppose à la stérilisation.

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(Continued from page 14)

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Resumen

Según las de encuestas recientes, la fecundidad en cuatro países de Latinoamérica ha disminuido rápidamente. Además, en tres de los cuatro países (Colombia, Ecuador y República dominicana) la diferencia de fecundidad entre mujeres instruídas y las carentes de escolaridad—la que fue muy grande durante los años 70—también ha empezado a reducirse. Sin embargo, las diferencias de fecundidad según escolaridad quedan substantivas, sobretodo en Perú, donde éstas persisten mientras la fecundidad general ha bajado.

En estos cuatro países, las mujeres de edad fecunda han completado de seis a siete años de escolaridad, aunque la proporción de mujeres sin escolaridad o con solamente 1–3 años oscila del 23 al 31 por ciento. Por lo general, esas mujeres se casan más tarde, tienen más probabilidades de usar algún método anticonceptivo moderno y desean familias más pequeñas que las mujeres sin educación..

En los cuatro países, el nivel educacional de las mujeres aumenta con suficiente rapidez para provocar una disminución de la fecundidad, simplemente por aumentarse el porcentaje de aquellas con mayor instrucción. De por sí, las mejoras educacionales explicarían entre el 40 y el 67 por ciento de la disminución de la fecundidad producida en los cuatro (suponiendo que no haya habido modificaciones de la conducta reproductiva dentro de los grupos educacionales). Al mismo tiempo, la reducción de la fecundidad dentro de grupos educacionales ha sido grande y en tres de los cuatro países, ha contribuido a más de la mitad de la disminución observada de la fecundidad. Además, el uso de anticonceptivos a aumentado significativamente dentro de todos los grupos, mientras que el tamaño de familia ideal parece haber disminuido. Al mismo tiempo, se demuestra dentro de cada grupo una tendencia dentro de los grupos hacia el matrimonio más precoz y más universal—un resultado inesperado.

Résumé

Il y a eu une décroissance rapide de la fécondité dans quatre pays d'Amérique latine, d'après de nouvelles données. En plus, dans trois des quatre pays (Colombie Equateur et la République dominicaine), l'écart entre la fécondité des femmes instruites et celle des femmes non instruites, qui a été très large pendant les années 70, a commencé à se rétrécir. Néanmoins, les différentielles de scolarisation restent significatives, surtout au Pérou où cette différentielle persiste tandis que le fécondité globale a diminué.

Dans ces quatre pays, les femmes en âge de procréer comptent en moyenne entre six et sept ans de scolarisation bien que la proportion sans éducation formelle ou peu instruite (1–3 ans) s'échelonne entre 23 et 31 pour cent. En général, ces femmes-là se marient plus tard et sont plus suceptibles d'utiliser une méthode contraceptive moderne ainsi que de désirer une famille moins nombreuse que les femmes sans éducation.

Dans les quatre pays, simplement du fait d'une augmentation de la proportion de femmes plus instruites, le niveau de scolarité atteint par les femmes adultes accuse une croissance suffisamment rapide pour infléchir le taux de fécondité.. Cette amélioration à elle seule expliquerait entre 40 et 67 pour cent de la baisse de fécondité dans les quatre pays (en assumant qu'il ne s'est pas produit de changement de comportement procréateur à l'interieur de chaque groupe de scolarité). En même temps, les déclins de fécondité à l'intérieur de chaque catégorie scolaire ont été grands, et dans trois pays, ils ont contribué à la réduction observée de la fécondité. En plus, la pratique de la contraception a augmenté à l'intérieur de chaque catégorie scolaire, tandis que le nombre idéal de la famille semble avoir baissé. En même temps, on note—résultat inattendu—une tendance vers le mariage plus tôt et universel dans chaque groupe de scolarité.

Use of Periodic Abstinence and Knowledge Of the Fertile Period in 12 Developing Countries

"The proportions of women in a union who currently practice periodic abstinence are quite modest, ranging from one percent in Liberia, Thailand and the Dominican Republic to 15 percent in Sri Lanka and 18 percent in Peru."

By Amy R. Sheon and Cynthia Stanton

Summary

Data from the Demographic and Health Surveys carried out in 12 African, Asian and Latin American countries show that in 10 of the countries, fewer than 22 percent of women have ever practiced periodic abstinence and fewer than seven percent currently practice that method. In Sri Lanka and Peru, however, 40 percent of women have used periodic abstinence, and 15 percent and 18 percent, respectively, are currently using the method. The vast majority of women who practice periodic abstinence use the calendar, or rhythm, technique to determine their fertile period; one-fourth to more than one-half of current users in seven countries report using an additional method (usually the condom or withdrawal) during the same month. The problem that women who have heard of periodic abstinence most often associate with that method is its ineffectiveness, and the most common reason users give for discontinuation is method failure.

In every country, women who have ever practiced periodic abstinence are more likely than others to know when their fertile period is, but even among ever-users, knowledge is far from universal: Morocco, Sri Lanka, Colombia, the Dominican Republic, Ecuador, and Peru are the only countries where at least half of all women who are ever-users of periodic abstinence are able to correctly identify the fertile period.

Amy R. Sheon is a health specialist with the AIDS program, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md., and Cynthia Stanton is a study manager with the Health Studies Group, Westat, Rockville, Md. Both authors were formerly country monitors for the Demographic and Health Surveys Program. An earlier draft of this article was presented at the annual meeting of the American Public Health Association held in Boston, Nov. 13–17, 1988. The authors wish to thank those who reviewed this paper and the staff of the Demographic and Health Surveys Program for their helpful comments.

Introduction

Periodic abstinence from sexual intercourse has been one of a number of traditional practices observed in many cultures. Because the suggested times to abstain from intercourse vary among countries and may or may not be based on a woman's fertile period, the practice has had varying levels of impact on fertility.

Until recently, most programs that taught and promoted periodic abstinence were affiliated with the Catholic Church. However, in recent years, other organizations have become increasingly involved in teaching the method. Several scientifically based techniques of determining the fertile period are now promoted for use by couples who for religious, health or other reasons do not wish to use mechanical, hormonal or surgical means of contraception. These techniques, which are collectively referred to as "natural family planning" methods, include the basal body temperature method, the cervical mucus (or Billings) method and the sympto-thermal method. The basal body temperature method requires women to chart their temperature at rest every day. Because body temperature rises slightly after ovulation, this method can indicate when ovulation has occurred. The cervical mucus method relies on changes in the volume and consistency of cervical mucus to signal the fertile period. The sympto-thermal method uses a combination of cervical mucus and basal body temperature to predict and detect ovulation.

Although the successful practice of any of the natural family planning methods requires that couples abstain from sex for long periods—in some cases as many as one-half of the days in a woman's menstrual cycle—advocates say that the methods promote husband-wife communication and shared responsibility.[1]

During the first half of this decade, the United States, which is the largest single donor of funding for international population programs, steadily increased its funding of programs that teach natural family planning methods from $800,000 in 1981 to $7,800,000 in 1985.[2] Given the current interest shown by U.S. policymakers and private organizations in the promotion of natural family planning methods among people in Third World countries, this article examines knowledge and use of periodic abstinence among women of reproductive age in 12 developing countries. The data used in the study are from countries that have recently completed a Demographic and Health Survey (DHS), in which a nationally representative sample of women aged 15–49 were interviewed.

The data were collected between 1986 and 1988 in Burundi, Liberia, Ghana, Morocco, Sri Lanka, Thailand, Brazil, Colombia, the Dominican Republic, Peru, Ecuador and Trinidad and Tobago.

Two standard questionnaires were used in DHS countries.[3] The Model A Questionnaire collected data on knowledge, attitudes, ever-use and current use of contraception; it also included questions to obtain a complete contraceptive history. This questionnaire was used in countries with high levels of contraceptive prevalence, primarily those of Latin America and Asia. The Model B Questionnaire collected the same information as the Model A questionnaire, but did not include questions on contraceptive history. This questionnaire was used in countries with low levels of contraceptive prevalence, primarily those of Africa. Because of the differences in the questionnaires, some of the topics covered in this article are not applicable to every country.

Use of Periodic Abstinence

Both questionnaires asked respondents to name all the methods of contraception known to them. Interviewers then probed to determine if the respondents had heard

Table 1. Percentage of women aged 15–49 and currently in a union who know of, have ever used or currently use periodic abstinence or modern contraceptive methods, 12 DHS countries, 1986–1988

Country	Knowledge		Ever-use		Current use*		N
	Periodic abstinence	Any modern†	Periodic abstinence	Any modern†	Periodic abstinence	Any modern†	
Africa							
Burundi	46.9	63.8	18.8	2.3	4.8	1.2	2,669
Ghana	41.0	76.5	19.7	22.5	6.2	5.1	3,156
Liberia	12.4	68.0	3.3	15.9	0.6	5.5	3,539
Morocco‡	51.7	97.5	9.2	53.9	2.3	28.9	5,447
Asia							
Sri Lanka‡	61.9	99.1	39.6	52.2	14.9	40.6	5,442
Thailand‡	28.6	99.5	5.7	82.4	0.9	63.6	6,236
Latin America & Caribbean							
Brazil§	78.1**	99.9	21.7**	82.0	4.3	56.7	3,471
Colombia	64.5	99.4	19.6	75.0	5.7	52.5	2,850
Dominican Republic	52.7	99.3	9.3	69.1	1.4	46.7	4,133
Ecuador	50.5	90.0	17.5	54.7	6.1	35.8	2,957
Peru	73.9	86.6	39.8	40.6	17.7	23.0	2,900
Trinidad & Tobago	47.9	98.9	11.5	79.2	2.6	44.4	2,617

*Includes only those women who reported periodic abstinence as the first method.

†Includes the pill, the IUD, injectables, vaginal methods, the condom, male and female sterilization and NORPLANT®.

‡Restricted to ever-married women. §Restricted to women aged 15–44.

**In Brazil, the calendar and Billings methods were treated as separate methods. In this and following tables, knowledge and use data refer to either the calendar method or the Billings method (unless otherwise noted).

about specific methods that they had not mentioned spontaneously. For example, respondents who did not spontaneously name periodic abstinence were asked the following question: "Couples can avoid having sexual intercourse on certain days of the month when the woman is more likely to become pregnant. Have you ever heard of this method?" In each country, probes were translated into local languages and were modified to incorporate terminology familiar to respondents.

Table 1 displays prevalence of knowledge, ever-use and current use of periodic abstinence and modern contraceptive methods among women currently in a union* in the 12 countries. The knowledge columns include both spontaneous and probed responses. The data indicate that the proportion of women in union in each country who are familiar with periodic abstinence ranges widely, from 12 percent of those in Liberia to 78 percent of those in Brazil. Women who live in the Sub-Saharan African countries are least likely, and those who live in the Latin American nations are most likely, to have heard of periodic abstinence. Although knowledge of modern contraceptive methods follows the same regional patterns as does knowledge of periodic abstinence, modern methods are much more widely known. Almost all women in the Asian and Latin American countries and 64–77 percent of those in the Sub-Saharan African countries are familiar with modern methods.

As the table shows, up to 22 percent of women in a union in all of the countries studied except Peru and Sri Lanka have ever practiced periodic abstinence; in Peru and Sri Lanka, 40 percent of such women have tried this method. Further, the proportions of women in a union who currently practice periodic abstinence are quite modest, ranging from one percent in Liberia, Thailand and the Dominican Republic to 15 percent in Sri Lanka and 18 percent in Peru.

Table 2 shows that when women who have heard of periodic abstinence were asked what they consider to be the main problem with the method, between 30 and 71 percent said they know of no problems associated with it. The proportion of respondents in each country who named specific problems ranges from 22 to 56 percent, except in Sri Lanka, where only 12 percent of respondents named specific problems. By far, the problem that was most often mentioned in most countries is the method's ineffectiveness: One-third or more of the respondents in Morocco, Thailand, Brazil, Colombia and Peru gave this response, as did more than one-fifth of the women in the Dominican Republic, Ecuador and Trinidad and Tobago. In every country except Burundi, the second most often mentioned problem was the method's inconvenience, cited by 1–13 percent of respondents.

In all the countries except Trinidad and Tobago, a relatively high proportion (between 10 and 34 percent) of the women who reported familiarity with periodic abstinence said that they do not know what problems are associated with the method. A response of this nature suggests limited familiarity with the method. Another indication of limited knowledge is that in every country, women who said that they do not know what problems are associated with the method were much less likely to have spontaneously mentioned periodic abstinence than to have recognized the method when asked about it (not shown).

Because natural family planning encompasses different ways of determining the days on which to abstain from sexual intercourse to avoid pregnancy, women who have ever practiced periodic abstinence were asked: "The last time you used periodic abstinence, how did you determine on which days you had to abstain?" The data (not shown) reveal that calendar rhythm is by far the leading method used: Between 85 and 99 percent of women in all the countries have relied on this technique to determine their fertile period. Use of the basal body temperature method is higher in Liberia (where eight percent of ever-users used this method the last time) than in any of the other countries (where fewer than three percent of ever-users did). Use of the cervical mucus method is highest in the Dominican Republic and Burundi, where five percent and four percent of ever-users, respectively, have relied on it. In all the other countries, only three percent or fewer of ever-users have practiced the cervical mucus method. Among respondents who did not cite calendar rhythm as the last method used, "other method" was generally named more often than the temperature or mucus techniques, suggesting that such women use folkloric methods to determine the fertile period.

Table 3 presents the levels of ever-use of periodic abstinence among women ever in a union, according to level of education attained. (The proportions of ever-users in each education category in every country were standardized on the age distribution of the Sri Lanka sample to eliminate the effect of differential age distributions within education categories and across countries.) As the table shows, in every country, ever-use of periodic abstinence

*"Women currently in a union" includes both married women and women living with partners in a consensual union.

rises dramatically with education, paralleling the relationship commonly seen between education and use of all contraceptive methods. In all the countries, fewer than 16 percent of women with no education have ever practiced periodic abstinence, but the method has been tried by 31–64 percent of women who have attained more than a secondary education.

Because periodic abstinence is the only family planning method acceptable to the Catholic Church, one might expect Catholics to be more likely than women of other religions to practice it.* In fact, the data indicate that Catholic women in Liberia and Trinidad and Tobago are more likely than women of other faiths to have tried the method (not shown). However, the evidence suggests that factors other than religion may also influence women to try periodic abstinence. For example, in Sri Lanka, where 39 percent of ever-married women have practiced periodic abstinence, women of other Christian faiths and Buddhists are as likely as Catholics to have used this method (36 percent and 42 percent vs. 40 percent). Further, in Sri Lanka, substantial proportions of Muslims and women of "other" religions have used periodic abstinence (27 percent and 23 percent, respectively), and in Thailand and Brazil, higher proportions of non-Catholics than Catholics have done so.

In countries with high contraceptive prevalence, respondents whose last discontinued method was periodic abstinence were asked why they had stopped practicing it. The data (not shown) indicate that in seven out of the nine high-prevalence countries, the leading reason for discontinuation is method failure, cited by 30–56 percent of respondents in each country. The second most common reason given in many countries, and the leading reason for discontinuation in Thailand, is the desire to become pregnant. Other reasons for discontinuation include infrequent intercourse (cited by 10 percent of women in Peru, eight percent of those in Trinidad and Tobago and fewer than five percent of women in all other countries) and opposition by the partner (cited by 0–5 percent of women in all countries).

Knowledge of the Fertile Period

Successful use of periodic abstinence requires that women correctly identify the fertile period of the menstrual cycle. Therefore, it is important to assess levels of knowledge of the fertile period among ever-users of the method. It is also useful to compare that with knowledge of the fertile period among never-users of the method.

The DHS ascertained respondents' knowledge of the fertile period by their responses to the question: "When during her monthly cycle do you think a woman has the greatest chance of becoming pregnant?" Interviewers were trained to code responses using the following categories: "during her period," "just before her period," "just after her period," "during the middle of the cycle," "any time" and "don't know." If, in the interviewer's opinion, the woman gave the correct response, the interviewer recorded "middle of the cycle." Although it is not possible to determine whether a correct response means that the woman understands the ovulation cycle well enough to use periodic abstinence successfully, this measure can serve as a general indicator of respondents' knowledge of the fertile period. Given the overall minimal level of knowledge of the fertile period among respondents, collection of more detailed information on the subject would have been difficult.

As Table 4 (page 32) shows, the proportion of women ever in a union who correctly identified the fertile period ranges from six percent in Liberia to 44 percent in Sri Lanka, with the proportion generally

Table 2. Percentage distribution of women in a union who know of periodic abstinence, according to their perception of the main problem associated with use of the method, 10 DHS countries

Country	Main problem							N.
	None	Not effective	Partner disapproves	Inconvenient	Other	Don't know	Total	
Africa								
Burundi	46.9	11.1	10.5	0.2	1.8	29.6	100.0	1,498
Morocco	29.4	33.7	*	13.4	2.6	20.9	100.0	3,090
Asia								
Sri Lanka	66.3	7.1	0.6	3.9	0.8	21.3	100.0	3,558
Thailand	41.0	33.1	0.9	4.3	0.7	20.0	100.0	1,911
Latin America & Caribbean								
Brazil†	45.8	37.3	0.8	3.4	1.2	11.5	100.0	4,353
Colombia	34.2	42.9	1.5	8.6	2.8	10.0	100.0	3,261
Dominican Republic	34.8	21.1	1.3	6.2	3.0	33.6	100.0	3,796
Ecuador	42.4	26.3	0.9	2.7	4.6	23.1	100.0	2,214
Peru	40.0	36.4	0.1	1.2	1.9	20.4	100.0	3,552
Trinidad & Tobago	71.4	26.5	0.0	1.2	0.4	0.5	100.0	1,760

*Not listed as a separate category in the questionnaire. †Among women who know calendar rhythm only.

Table 3. Percentage of women ever in a union who have ever practiced periodic abstinence, by education,* 11 DHS countries

Country	Total	Education				N
		None	Primary	Secondary	Higher	
Africa						
Burundi	17.8	15.5	28.3	41.4	†	2,924
Liberia	3.7	1.0	5.7	19.3	47.0	4,116
Morocco	9.2	5.2	19.9	38.3	58.2	5,982
Asia						
Sri Lanka	38.6	15.6	30.9	44.0	50.6	5,864
Thailand	5.7	2.6	3.3	19.7	30.8	6,775
Latin America & Caribbean						
Brazil	18.7	6.3	15.8	34.1	47.0	3,867
Colombia	19.3	8.1	14.9	29.9	37.1	3,336
Dominican Republic	9.1	1.6	4.4	18.7	35.5	5,250
Ecuador	17.0	3.2	11.2	27.1	40.8	3,251
Peru	39.0	15.9	34.3	50.9	64.3	3,238
Trinidad &Tobago	11.9	0.0	4.9	22.6	44.9	2,926

*Standardized on the age distribution of the Sri Lanka sample. †Fewer than 20 cases.

*The five DHS countries that ascertained respondents' religions were Liberia, Sri Lanka, Thailand, Brazil and Trinidad and Tobago.

Table 4. Percentage of women who correctly identify the fertile period, by marital status, ever-use and current use of periodic abstinence, 11 DHS countries

Country	Knowledge of the fertile period							
	Ever in a union	N	Never in a union	N	Ever-users	N	Current users*	N
Africa								
Burundi	21.4	2,924	7.8	1,046	35.3	544	40.5	158
Liberia	6.4	4,116	7.5	1,123	21.7	229	29.3	41
Morocco	17.3	5,982	na	na	50.3	521	55.7	131
Asia								
Sri Lanka	43.9	5,864	na	na	64.0	2,261	68.8	883
Thailand	12.8	6,775	na	na	39.0	380	37.9	69
Latin America & Caribbean								
Brazil	26.5	3,867	26.0	2,025	49.3	888	54.4	195
Colombia	31.4	3,337	32.6	1,994	59.3	676	60.7	187
Dominican Republic	19.7	5,250	19.4	2,395	50.7	471	49.2	61
Ecuador	24.0	3,251	22.6	1,462	50.0	554	50.5	192
Peru†	na	na	na	na	73.1	1,295	75.0	571
Trinidad & Tobago	18.5	2,926	15.7	880	47.2	335	55.7	97

*Includes women who use periodic abstinence as a second method, except in Liberia.

†Question only asked of those who know of periodic abstinence and have ever used any method.

Note: na = not applicable.

falling between 17 and 27 percent. Although women never in a union might be expected to be less likely than other women to know the fertile period, the data indicate that that is not uniformly true: In Liberia, Brazil, Colombia, the Dominican Republic and Ecuador, women never in a union are about as likely as those ever in a union to know when the fertile period occurs, possibly because the former have achieved higher levels of education than the latter. In general, however, knowledge of the fertile period is low in these countries.

In every country, women who have ever used periodic abstinence are much more likely than ever-married women overall to know their fertile period, but even among ever-users, knowledge is far from universal. For example, in Morocco, while only 50 percent of ever-users of periodic abstinence know when the fertile period is, even fewer (17 percent) ever-married women know. Overall, knowledge among women who have ever practiced periodic abstinence ranges from 22 percent in Liberia to 73 percent in Peru. Knowledge of the fertile period among current users is not much higher than it is among ever-users in any country.

Because ever-users of periodic abstinence have been shown to be better educated than other women, it is instructive to compare knowledge of the fertile period among periodic abstinence ever-users and never-users at every level of education. By doing so, one can determine if a woman's knowledge of the fertile period is simply a function of her education level, or if ever-users have received information on the subject that is not generally known among other women in the population. The data (not shown) indicate that not only does knowledge of the fertile period rise dramatically with education, but at every level of education, ever-users of periodic abstinence are much more likely than never-users to know when the fertile period occurs. In Morocco, for example, 11 percent of never-users who have had no education know when the fertile period is, compared with 29 percent of ever-users with no education. In contrast, 81 percent of never-users with more than a secondary education know their fertile period, compared with 93 percent of ever-users who have attained the same level of education. These findings suggest that women who have used periodic abstinence have received at least some information about the method.

However, the overall level of knowledge of the fertile period among ever-users and never-users is low. Morocco, Sri Lanka, Colombia, the Dominican Republic, Ecuador and Peru are the only countries studied where at least half of all the women who have ever used periodic abstinence are able to correctly identify the fertile period. In no country does the overall proportion of never-users who can correctly identify the fertile period exceed 31 percent. In fact, overall levels of knowledge of the fertile period are so low that one might wonder whether the respondents understood the question; however, it seems reasonable to assume that they did, because differences in levels of knowledge according to educational level are so consistently in line with expectations.

The DHS asked current users about the source of their current method. In some countries, current users of periodic abstinence were asked if they had visited a place in the last 12 months to obtain instructions for using the method; in a few countries, women were asked if they had ever received instructions. Because the question was either not asked or was restricted to the last 12 months in a majority of countries in the study, relevant data on the source of instruction for periodic abstinence are not available. Women who use natural family planning methods to identify their fertile days in order to avoid pregnancy may choose not to abstain from sex-

Table 5. Among women who practice periodic abstinence, percentage who used an additional method the month before the survey, and percentage distribution of such women according to the additional method used, 9 DHS countries

Country	% using additional method	Additional method used									N
		Pill	IUD	Injectables	Vaginal	Condom	Withdrawal	Other	None	Total	
Africa											
Morocco	21.4	1.5	0.0	0.0	0.8	5.3	11.5	2.3	78.6	100.0	131
Asia											
Sri Lanka	32.3	0.9	0.2	0.0	0.0	3.9	26.0	1.3	67.7	100.0	883
Thailand	52.4	5.3	0.0	0.0	0.0	24.9	18.1	4.1	47.6	100.0	69
Latin America & Caribbean											
Brazil	27.2	2.6	0.5	0.0	0.5	8.7	12.8	2.1	72.8	100.0	195
Colombia	25.7	0.0	1.8	0.0	5.7	2.7	14.7	0.8	74.3	100.0	187
Dominican Republic	25.5	0.9	0.0	0.0	2.3	8.7	10.2	3.4	74.5	100.0	61
Ecuador	15.1	1.0	1.0	0.5	2.6	5.2	4.7	0.0	84.9	100.0	192
Peru	24.3	1.2	0.0	0.4	2.1	3.1	14.4	3.1	75.7	100.0	571
Trinidad & Tobago	53.6	2.1	0.0	0.0	7.2	27.8	15.5	1.0	46.4	100.0	97

ual intercourse on fertile days; such women are said to be practicing fertility awareness rather than periodic abstinence. (However, in the DHS, women are not excluded as periodic abstinence users if they do not abstain on fertile days.)[4] To determine whether women who practice periodic abstinence use the method alone or in conjunction with other methods, the Model A Questionnaire asked current users of all methods: "At any time during the same month, do you regularly use any method other than (current method)?" Women who said they use periodic abstinence either as their first or additional method are classified according to the additional method currently used, as Table 5 shows.

The table reveals that the use of natural family planning techniques in combination with other methods is quite common in some countries. More than one-half of current users of periodic abstinence in Thailand and Trinidad and Tobago and at least one-fourth of current users in five other countries report using a combination of methods during the same month. In all countries except Colombia, condom and withdrawal are the two methods most frequently used in combination with periodic abstinence. In Colombia, withdrawal and vaginal methods are most frequently used. A small proportion of women in some countries claimed to be using the pill or the IUD in combination with periodic abstinence. Such seemingly improbable method combinations may have occurred because women were instructed to use a back-up method when starting a new method.

Discussion

Results from the DHS in the 12 countries studied show that overall, levels of knowledge of periodic abstinence are modest and levels of use are very limited. Fewer than seven percent of women in a union in all the countries but Sri Lanka and Peru currently practice periodic abstinence. Because the DHS data on use of the method are very similar to the results of World Fertility Surveys (WFS) and Contraceptive Prevalence Surveys (CPS) conducted in the study countries between 1977 and 1983,* there appears to have been no increase in the use of periodic abstinence in recent years. However, it is possible that recent efforts to promote natural family planning have attracted new users, but that this increase has been cancelled out by a concurrent decline in use in countries characterized by increasing education and urbanization—processes associated with the breakdown of traditional practices.

Interestingly, there appears to be no evident pattern in the relationship between use of periodic abstinence and use of modern methods. Two distinct phenomena may be taking place simultaneously: In countries where traditional practices remain common, women who use periodic abstinence to avoid pregnancy may switch to modern methods when they become available, and the use of periodic abstinence may decline as a result. On the other hand, in countries where modern methods are widely available and where periodic abstinence as a traditional practice is rare, women may adopt the method for religious reasons or to avoid the perceived health risks of other methods.

Calendar rhythm is the method of periodic abstinence last used by the vast majority of ever-users: Use of other types of periodic abstinence is minimal.

The fact that many women who practice periodic abstinence report using additional methods during the same month has implications for the evaluation of contraceptive failure rates. Failure rates for periodic abstinence and coitus-dependent methods that are calculated from survey data but are based on only one reported method may be understated or overstated because of the protection offered by a second method. For example, condom users who abstain from intercourse during the fertile period will experience a lower rate of failure than condom users who have intercourse throughout their cycles. On the other hand, periodic abstinence users who rely on condoms during the fertile period may experience a higher rate of failure than periodic abstinence users who abstain during the fertile period.

The problem most often associated with periodic abstinence among women who are familiar with the method is its ineffectiveness, and method failure is the most common reason given for discontinuation in many countries. Given the high proportion of users who could not identify the fertile part of the menstrual cycle, failure and fear of failure are not surprising.

The differences in levels of knowledge of the fertile period according to the woman's education are remarkably consistent across the countries included in this study. That between 58 and 93 percent of highly educated ever-married women who have ever used periodic abstinence correctly identified the fertile period is in sharp contrast to the minimal levels of knowledge recorded among less-educated women. This finding suggests that if the prevalence of periodic abstinence is to increase, particularly among less-educated women, the responsibility of educating women about the reproductive cycle and of convincing women of the effectiveness of periodic abstinence will fall on the programs promoting this method.

Since so much attention has been devoted to the promotion of periodic abstinence in recent years, there are a number of issues that need to be explored. For example, because of the wide variation in levels of knowledge of the fertile period, and because many women in traditional societies may have been taught to observe periodic abstinence as a traditional practice not directly related to the ovulation cycle, future surveys should include more detailed questions on where women get their information about periodic abstinence and on what specific instructions they are given for determining the fertile period. Other areas of research could include an assessment of the contraceptive failure rates among women who practice periodic abstinence, according to their level of education and according to their simultaneous use of other methods. In addition, researchers could assess levels of satisfaction with the method by comparing method continuation rates and reasons for method discontinuation among periodic abstinence users; the results of such analyses could help to guide program personnel in designing educational programs for the method.

*The WFS and CPS programs asked about calendar rhythm only. In WFS programs, the definition of rhythm used in the knowledge probe was similar to that used in DHS programs. In CPS programs, no standardized probe was used. The effect of different survey techniques on reported levels of knowledge and use has not been ascertained.

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Resumen

Los datos de las Encuestas Demográficas y de Salud realizadas en 12 países de África, Asia y América Latina muestran que, en 10 de ellos,

las mujeres que han practicado alguna vez la abstinencia periódica son menos del 22 por ciento, mientras que las que actualmente practican este método no llegan al siete por ciento. En Sri Lanka y el Perú, sin embargo, ha practicado alguna vez la abstinencia periódica un 40 por ciento de las mujeres, al tiempo que, respectivamente, un 15 por ciento y un 18 por ciento lo emplea en la actualidad. La enorme mayoría de las que recurren a la abstinencia periódica aplica, para determinar su período fecundo, la técnica del ritmo o del calendario. En siete países, entre la cuarta parte y más de la mitad de las actuales usuarias dicen utilizar durante el mismo mes algún método adicional (por lo común condón o retiro). El problema que las mujeres que han oído hablar acerca de la abstinencia periódica le atribuyen más frecuentemente es su ineficacia, siendo la falla del método la razón más generalmente aducida por las usuarias que han dejado de practicarlo.

En todos los países, resulta más probable que sepan cuándo es su período fecundo las mujeres que han practicado alguna vez la abstinencia periódica, pero aún entre ellas el conocimiento dista de ser universal. Marruecos, Sri Lanka, Colombia, la República Dominicana, Ecuador y el Perú son los únicos países donde al menos la mitad de las mujeres que han usado el método alguna vez pueden identificar correctamente su período fecundo.

Résumé

Les données des Enquêtes de démographie et de santé menées en Afrique, en Asie et en Amérique latine montrent que dans 10 de ces pays, moins de 22 pour cent des femmes ont pratiqué l'abstinence périodique, et moins de sept pour cent la pratiquent actuellement. A Sri Lanka et au Pérou, cependant, 40 pour cent des femmes ont pratiqué l'abstinence périodique, et 15 et 18 pour cent, respectivement, utilisent cette méthode à présent. La vaste majorité des femmes qui pratiquent l'abstinence périodique, utilisent la méthode du rythme (calendrier) pour déterminer leur période fertile; entre un quart et la moitié des utilisatrices actuelles dans sept pays signalent utiliser une méthode additionnelle (généralement le préservatif ou le retrait) durant le mois.

Le problème le plus fréquemment associé à l'abstinence périodique par les femmes qui en ont entendu parler est son inefficacité. L'échec de la méthode est la raison la plus souvent citée d'abandonner sa pratique. Dans tous les pays, les femmes qui ont pratiqué l'abstinence périodique sont plus susceptibles que les autres de savoir le moment de leur période fertile, mais parmi celles qui l'ont déjà utilisée, cette connaissance est loin d'être universelle: Le Maroc, le Sri Lanka, la Colombie, la République dominicaine, l'Equateur et le Pérou sont les seuls pays où au moins la moitié des femmes ayant déjà utilisé l'abstinence périodique soient capables d'identifier correctement leur période fertile.

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Special Report

Weighing the Evidence on the Pill and Breast Cancer

By Jeanette H. Johnson

Summary

Three new studies have found some connection between oral contraceptive use and breast cancer among women younger than 45. None of the studies find an increased risk of breast cancer among the same subgroups of women, and their results are contradictory. Consequently, a committee advising the U.S. Food and Drug Administration concluded that "the existing data do not support a change in prescribing practices by physicians or in the use of oral contraceptives by women."

One of the three studies, a U.S. hospital-based analysis of breast cancer patients, showed ever-users of the pill to have a statistically significant risk of breast cancer of 2.0 compared with never-users. The relative risk was elevated in virtually all duration-of-use categories. A significantly increased relative risk was also found among ever-users aged 30–34 and 35–39, among those who did not experience menarche until age 14 or older and among those who were parous. No significant difference in risk of breast cancer was found by whether pill use began before or after age 25.

A new analysis of data from the U.S. population-based Cancer and Steroid Hormone Study found no increased risk among parous women or those who had used the pill for less than eight years. However, nulliparous women who had experienced menarche prior to age 13 and had used the pill for eight or more years did have a significantly increased relative risk. Most of the increased risk was confined to women who had begun pill use as teenagers; they had a relative risk of 5.6 compared with never-users.

Researchers from Britain's Royal College of General Practitioners analyzed data on 239 cases of breast cancer that have been diagnosed since they began their study of oral contraceptive use in 1968. The results show that ever-users aged 30–34 at diagnosis had a statistically significant increased risk of 3.3 compared with never-users. Women of parity one had a relative risk of 5.9; there was no increased risk among nulliparous women or those with more than one child.

Introduction

Since the pill first became available in 1960, numerous studies have been conducted to determine what effect its manipulation of the body's normal hormone profile might have on women who use this method of contraception. One of the primary areas of interest has been whether or not estrogen and progestogen—the hormones found in the pill—have any effect on cancers of the reproductive system.

Overall, the news has been more good than bad. Studies finding that oral contraceptives protect women from endometrial cancer have been as unanimous as scientific research can ever be: Women who take the pill for two years have a risk of endometrial cancer of 0.6 compared with never-users of the pill, and those who use it for four years have their relative risk reduced to about 0.4.[1] Researchers have also determined that oral contraceptives protect against ovarian cancer, the relative risk being 0.5 among women who have used the pill for four years.[2] The relationship with cervical cancer is still somewhat of a question. Some evidence exists to show that the risks of cervical dysplasia and carcinoma in situ are elevated after two or more years of pill use, but a consensus remains elusive because few if any of the studies have been free of confounding factors that might bias the results.[3] Some of the same problems with confounding factors exist in studies of the risk of invasive cervical cancer, which appears to be elevated after five years of pill use and may reach a level of 2.0 by 10 years of use.[4]

There is a sense that medical science may have to wait quite a while—until the young women who first took the pill pass through their reproductive years—to see whether the use of oral contraceptives will affect the incidence of breast cancer. The reason is that the disease has a very long latency period and primarily strikes older women. Analyses using U.S. data indicate that at 30 years of age, 28 in every 100,000 women are diagnosed as having breast cancer; at age 50, the incidence is 195 in every 100,000 women, and at age 70, the number rises to 362 women in every 100,000.[5] Because oral contraceptives did not become available until 1960, comparatively few women now older than 60 would ever have used the pill, and women in their 50s could not have taken it early in their reproductive careers. Consequently, most studies of the relationship between the pill and breast cancer have been confined to younger women, whose risk is small and who make up only a small fraction of the breast cancer population.

Nonetheless, an increase in the risk of breast cancer among young women could signal bigger problems to come. Until recently, studies done on women younger than 45 had raised a few cautionary flags regarding the pill's relationship to breast cancer but had been generally reassuring. Researchers had looked at the risk of breast cancer by, among other factors, duration of use, use before or after a first term pregnancy, age when use began, length of time since use was initiated and formulation of pill taken. Also considered in these studies was the susceptibility of the user to an increased risk of breast cancer by virtue of family history or some other condition known to be associated with the disease, such as race, age at menarche, obesity and a history of benign breast disease. Most results were negative and the majority of researchers concluded that pill users over-

Jeanette H. Johnson is an editor of *International Family Planning Perspectives*.

all had no statistically significant increased risk of breast cancer.[6] However, the research indicated that some women—those who used the pill for at least eight years or for several years before a first term pregnancy or before age 25—might experience an increased risk.[7]

In late 1988 and early 1989, researchers were jolted by the results of three new analyses of data for premenopausal women, all of which found some connection between the pill and breast cancer. A hospital-based study indicated that ever-users of the pill have an increased risk of breast cancer, even those who have taken oral contraceptives for fewer than three months.[8] Further results from Britain's Royal College of General Practitioners' Oral Contraception Study showed that the only women who have a significant increased risk are ever-users aged 30–34 and those who have one child at the time their breast cancer is diagnosed.[9] The third analysis, using data from the U.S. Cancer and Steroid Hormone Study, found that ever-users who are nulliparous run an increased risk of developing breast cancer, provided they experienced menarche before age 13 and have taken the pill for eight or more years.[10]

Worldwide, about 55 million women—or approximately 15 percent of contraceptive users—rely on the pill.[11] About 35 million of these women live in the developing world: 22 million in Asia, nine million in Latin America and four million in Africa. Surveys conducted during the 1980s indicate that the pill is most popular in Brazil, Jamaica, Mauritius, Morocco, Thailand and Zimbabwe. In each of these countries, at least 20 percent of currently married women aged 15–44 practicing contraception use the pill. Figures for developed countries indicate that among all women aged 15–44, the pill is the principal method in Australia, Austria, Belgium, Denmark, France, Great Britain, Netherlands, New Zealand, Sweden and West Germany.[12] Although sterilization is the leading method in the United States, the pill is used by about 35 percent of women practicing contraception, and is the leading method among young women and unmarried women.[13]

Although the new analyses contradict each other and the results of many previous research inquiries, the arrival back-to-back of three studies showing positive associations is the cause of much concern. All of the studies come from well-established projects, and all of them are from sources that have published previously on the topic. Consequently, a committee advising the U.S. Food and Drug Administration (FDA) scheduled special hearings to appraise the significance of the findings. In the end, the committee decided the findings were not definitive and recommended against any changes in prescribing practices.[14] However, the committee and the family planning world anxiously await the results of follow-up data from these three sources, other studies yet to be published and new studies about to get under way. Following is a summary of the three studies, the comments of the researchers who presented their results to the committee and the committee's conclusions.

Hospital-Based Study

From 1983 to 1986, breast cancer patients aged 25–44 admitted to 16 hospitals in New York, Philadelphia, Baltimore and Boston were enrolled in a study of the association between oral contraceptives and the risk of a breast cancer diagnosis before age 45.[15] Controls from the same age-group were selected from among patients admitted for nongynecologic and nonmalignant conditions unrelated to oral contraceptive use. Specially trained nurses interviewed the 407 cases and 424 controls while they were hospitalized regarding their health, personal habits and use of medication.

Seventy-two percent of breast cancer patients and 59 percent of controls had ever used oral contraceptives. A multiple logistic regression analysis controlled for the potentially confounding effects of numerous variables, such as age, age at first term pregnancy, parity, age at menarche, family history of breast cancer, body mass, alcohol consumption and religion. Compared with never-users, ever-users were found to have a statistically significant risk of breast cancer of 2.0. The relative risk was consistently elevated for all duration-of-use categories, and was statistically significant for categories of less than three months, 1–4 years, 5–9 years and 10 or more years. The relative risk was approximately 2.0 for most of these categories but rose to 4.1 for women who had used the pill for 10 or more years. However, there was no statistically significant trend of increasing risk with increasing duration of use.

The data were analyzed by five-year age-groups: Ever-users aged 30–34 and 35–39 were found to have significantly increased relative risks of 3.2 and 2.6, respectively. When the analysis was limited to women who had used the pill for five or more years, those aged 30–34 had a significantly increased relative risk of 3.9. There was no evidence that women exposed to the pill before age 25 incurred a higher risk relative to women who did not use it until after age 25. Pill users who had not experienced menarche until age 14 or older were at a statistically higher risk of breast cancer than comparable never-users; an increased risk among pill users who had experienced menarche before age 14 (younger than 12 and 12–13) had an increased risk when compared with never-users in this subgroup, but the increase was nonsignificant.

Ever-users of the pill who were nulliparous had a relative risk of 1.6, but the finding was not statistically significant. Parous women had a significantly increased relative risk whether they had used the pill prior to or following a first term pregnancy; the risks were 2.0 and 2.6, respectively. Only two levels of parity were examined—women who had 1–2 children and those who had three or more children—and at both levels, pill users were found to have statistically significant increased risks.

The Cash Study

In the Cancer and Steroid Hormone (CASH) Study, women whose breast cancer was diagnosed between December 1, 1980, and December 31, 1982, and who were aged 20–54 at the time of detection were ascertained through eight population-based cancer registries maintained by the National Cancer Institute.[16] Controls from the same geographic areas as the patients were selected through random telephone dialing and were matched with breast cancer patients by five-year age intervals. Premenopausal women were selected for the current analysis—2,945 patients and 2,646 controls. The data for nulliparous women and for parous women were analyzed separately by whether menstruation had begun before age 13 or after, by whether the cancer diagnosis had occurred before age 45 or after and by how long pill use had lasted (fewer than four years, 4–7 years, 8–11 years or 12 years or more). Among parous women, oral contraceptive use applied only to that which had occurred prior to a first full-term pregnancy; duration of pill use and length of use before a first pregnancy were highly correlated, however.

No increased risk was found among women who had used the pill for fewer than eight years, but the researchers found that nulliparous women who had experienced menarche before age 13 and had used the pill for 8–11 years were 2.7 times more likely to have breast cancer before

age 45 than were nulliparous women who also had experienced an early menarche but had never used the pill. Women with these characteristics who had used the pill for 12 or more years had a risk of breast cancer before age 45 that was 11.8 times that of never-users. Both these findings were statistically significant. Pill users with similar characteristics were at a decreased risk of breast cancer at age 45 or older compared with never-users. Few women at that age had used the pill for eight or more years, however, and the findings were not statistically significant. None of the findings for nulliparous women who had begun menstruating at age 13 or older and who had used the pill for eight or more years were statistically significant. The findings were also nonsignificant among parous women, regardless of age at menarche; few parous women had been long-term users of the pill, however.

To determine whether early use of oral contraceptives might have influenced the findings among their high-risk group, the researchers analyzed the relative risk of breast cancer before age 45 by whether long-term use had begun during the teenage years or at ages 20 and older. Nulliparous women with an early menarche who had begun long-term pill use as teenagers had a risk of 5.6 compared with similar never-users, and the risk was statistically significant. For those who had begun use later, the relative risk of 2.6 was of marginal significance (95 percent confidence interval, 1.0–6.9).

The researchers suggest that women who experience menarche before age 13 and remain nulliparous may be at increased risk of developing early breast cancer if they use oral contraceptives for eight years or longer. The risk appears to be greatest for those who begin taking the pill as teenagers. Because risk was not increased among all pill users and because it remained unchanged when adjusted for the tendency of physicians to examine pill users more frequently, the researchers believe that the findings may point to a promotional effect in which the pill advances the onset of breast cancer in susceptible women by a few years but does not change the level of breast cancer risk among all women. The researchers also point out that the high-risk group is a very small proportion—slightly more than one percent—of breast cancer patients; only 39 of the almost 3,000 patients in the study had had breast cancer detected prior to age 45, were nulliparous, had experienced menarche early and had used oral contraceptives for eight or more years.

The Royal College Study

Researchers from Britain's Royal College of General Practitioners began a study of oral contraceptives in 1968 with the enrollment of some 23,000 pill users and a like number of controls.[17] The study enrolled only married women or women living as married. Some 18,000 women remained in the study as of March 1985, when data on breast cancer risk among enrollees were analyzed; 239 cases of breast cancer were diagnosed during the accumulation of approximately 407,000 woman-years of data between 1968 and 1985.

The data, which were standardized for parity, social class and smoking habits, indicated that neither current users nor former users of the pill had a statistically significant increased risk of breast cancer when compared with never-users. Consequently, the two were grouped together as ever-users for most of the remaining analyses. For an examination of the risk of breast cancer by age at diagnosis, the women were categorized by five-year age-groups ranging from younger than 24 to 60–64.

Twenty-six cases of breast cancer had been diagnosed among women aged 30–34, and ever-users in this age-group were found to have a statistically significant increased risk of 3.3 compared with never-users. The relative risks in all other age-groups were nonsignificant. An analysis by parity at the time of diagnosis (0, 1, 2–3 and 4 or more children) also found one group to have a statistically significant increased risk of breast cancer—pill users with one child had a relative risk of 5.9. The results also indicated that women who had begun using the pill before age 25 had no higher risk of breast cancer than women who had begun using it at a later age.

Among all participants in the study, there was no evidence of a trend toward increased risk of breast cancer with increased duration of pill use. However, a significant trend emerged when the analysis was confined to women with one child at the time of diagnosis, and the elevation of risk began among those who had used the pill for as little as 2–3 years. An upward trend among the other group found to have an increased risk of breast cancer—women aged 30–34 at the time of diagnosis—was present but was not significant.

An analysis of former users of the pill found a significant trend toward greater risk of breast cancer with years since the method was last used, evidence perhaps of a latency period. A statistically significant increased risk began with 4–5 years since last use and peaked at 1.9 with 10 or more years since last use. Restricting the analysis of former users to women aged 30–34 at the time of diagnosis showed a steep increase in relative risk that became significant with 6–7 years since last use and that reached a peak of 15.8 at 8–9 years. Women who had one child at the time of diagnosis experienced a similar significant trend of increasing risk with the passage of time, the risk peaking at 13.2 after 10 or more years had passed since last pill use.

Like the CASH investigators, the Royal College researchers suggest that their data can be interpreted to indicate that the pill accelerates latent cancer rather than initiates cancer. They base their speculation on two findings. Women of parity one showed a significantly increased risk after only two years of pill use, yet cancer is believed to take many more years to develop. In addition, women aged 30–34 at diagnosis had been pinpointed as a group at increased risk in an analysis of data published by the Royal College in 1981.[18] The women aged 30–34 at that time were 35–39 in this most recent analysis, yet that age-group showed no increased risk of breast cancer, indicating that the cancers may merely have presented earlier than expected rather than increased in number.

The researchers calculate that the increased risk found for women aged 30–34 would be the equivalent of 14 breast cancer cases annually per 100,000 women, or one case of breast cancer each year for every 7,000 ever-users of the pill.

Evaluating the Results

One of the problems with evaluating not only these three studies but also those done before is that there is no one protocol followed by all of them, as was pointed out at the FDA committee hearing by James J. Schlesselman, a professor in the Department of Preventive Medicine and Biometrics at the Uniformed Services University of the Health Sciences, Bethesda, Maryland. To give but a few examples, researchers select their control groups differently; the factors they choose to examine are not the same; the age that is considered early for menarche is categorized variously; early pill use is defined sometimes as that occurring before age 20 and sometimes as that occurring before age 25; and some studies look only at nulliparous as opposed to parous women while others have a larger number of categories for parity. Overall, Schlesselman said, he was not reassured by the data presented, but he was not alarmed either.

Clifford Kay, director of the Royal College study, speculated on why his study

had pinpointed an increased risk among pill users of parity one. He suggested that the pill was negating the protective effect against breast cancer that first pregnancies normally provide to a woman, but not the protective effect conferred by additional pregnancies. Kay noted that even if his results were to be confirmed, the level of risk "might possibly be an acceptable one if you bear in mind the other benefits of the pill and, of course, the overwhelming benefit of effective contraception."

Samuel S. Shapiro, director of the Slone Epidemiology Unit at Boston University School of Medicine and one of the researchers involved in the hospital-based study, told the committee that "we are all highly confused by the contradictory findings." He acknowledged that the increased risk of breast cancer after short periods of pill use—particularly after less than three months of use—was a finding of his study that was "biologically implausible. I take it as evidence of some bias in our study." He suggested that one area of possible bias is selective diagnosis of breast cancer among oral contraceptive users; women taking the pill may be screened for breast cancer more frequently than women who are not on the pill.

Jeffrey Perlman, chief of the Contraception Evaluation Branch of the National Institute of Child Health and Human Development, testified that there has been an increase in the incidence of breast cancer in the United States since the pill came on the market. However, he said that the breast cancer rates are considerably below what would have been seen if all oral contraceptive users had a risk that was twice that of nonusers, as the hospital-based study indicated. In fact, Perlman added, even without the pill, there would have been an increase in the incidence of breast cancer among young women. He said that delayed childbearing has been the reason for much of the increased risk.

Data from the National Cancer Institute indicate that the incidence of breast cancer has been increasing by more than one percent each year—from about 90 cases per 100,000 white females in 1975 to 104 per 100,000 in 1985.[19] Some of this increase may be due to an increase in screening activities and attention that has grown out of publicity surrounding breast cancer diagnosis among prominent women. However, one analysis has shown how later age at first pregnancy, which is known to be associated with a higher risk of breast cancer, may also contribute to changes in the incidence of the disease.[20] The analysis notes that 71 percent of white women born in the United States between 1935 and 1939 had had at least one child by age 25, whereas only 49 percent of white women born between 1950 and 1954 had had at least one child by that age. Consequently, in comparison with the women who are 15 years older, the younger cohort is expected to have a risk of breast cancer of 1.1, or about 70,000 more cases of breast cancer than they would have experienced if 71 percent of them had borne a first child by age 25.

Bruce Stadel, acting chief of the Epidemiology Branch of the Food and Drug Administration and lead author of the CASH analysis, said he was not prepared, on the basis of his and other findings, to say that an increase in risk "is what happens. Rather the findings are suggestive of directions for further analysis." All three research projects will be continuing sources of data, and at least one other large-scale study will be launched by the National Cancer Institute. That study is expected to enroll 1,000 cases and an equal number of controls, with collection of data scheduled to be complete in 1992.

Many committee members as well as others who spoke from the fields of gynecology and reproductive health seemed to indicate that if conflicting results forced them to choose between a smaller case-control study that found an overall increase in risk and a larger population-based study such as CASH that did not, they would give more weight to the results of the latter. Consequently, the statement issued by the committee at the end of the hearing said that "in consideration of the total population of breast cancer cases and controls that have been reviewed in various studies, the overall risk of breast cancer in relation to oral contraceptive use is approximately 1.0; that is, there is no apparent association between oral contraceptive use and breast cancer."[21]

The committee added, however, that certain subgroups of women who use oral contraceptives may be at increased risk, including those who begin using the pill early in their childbearing years, those who use it for an extended period of time and those who use oral contraceptives prior to their first pregnancies. The committee emphasized that these findings "only occur in some studies and that other large studies have shown no such possible associations." It concluded, "The existing data do not support a change in prescribing practices by physicians or in the use of oral contraceptives by women."

The statement also recommended more basic research on the biology of the human breast, as well as large clinical studies of pill users. One of the weaknesses of the three recent analyses, as well as prior research, is that most of the women involved have taken older formulations of the pill that contain higher doses of hormones than do the pills currently marketed.

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DIGEST

Only 11 Percent of Senegalese Women Practice Birth Control: Most Popular Method Is Abstinence

Despite recent slight declines, fertility and mortality levels remain very high in Senegal, and the population is growing at an annual rate of 2.6 percent. Early and almost universal marriage are the norm in this predominantly Muslim country. Although women want large families, a substantial proportion say they would like to limit or space their births. Nevertheless, contraceptive prevalence is low, and modern methods of contraception are used almost exclusively by educated, urban women. These are some of the highlights of the Enquête Démographique et de Santé au Sénégal (EDS), carried out in 1986 among a sample of 4,415 women aged 15–49; data from a sample of 635 children aged 6–36 months were also collected.[1]

Senegal is a low-lying West African country of 6.7 million inhabitants; it is bordered by Mauritania to the north, Mali to the east, Guinea to the south and the Atlantic Ocean to the west. Although its population is predominantly rural, exodus from the countryside is swelling the size of the urban population at a rate of five percent annually. The Wolof are Senegal's largest ethnic group, followed by the Poular, the Serer, the Diola and the Mandingue. Eighty-five percent of the population are Muslim, and polygamy is practiced extensively by the Senegalese.

Overall, 77 percent of Senegalese women have had no schooling, 14 percent have received a primary education and nine percent have attained a secondary education. However, there are large differences in educational level according to residence: Forty-six percent of urban women have obtained some schooling but only seven percent of rural women have done so. In the western region (which includes Dakar, the capital), 35 percent of women are literate, compared with 17 percent of women who reside in the southern region and seven percent of those in the central region.

Nuptiality and Fertility

In 1986, the median age at marriage among Senegalese women 20–49 was 16.6. Between the 1978 Senegal Fertility Survey and the 1986 EDS, the median increased by one year among women in all age-groups, except those aged 45–49. Educational level appears to be the most important determinant of age at marriage: Women who have attended secondary school marry three years later than do those who have attended primary school only, and they marry five and one-half years later than do those who have had no education. On average, urban women marry later than rural women (17.6 years vs. 16.0 years), and the difference in median age at marriage among older and younger urban women is quite pronounced (15.9 among 45–49-year-olds vs. 18.8 among 25–29-year-olds).

By their middle 30s, all Senegalese women have married at least once. The proportion of ever-married women rises from 44 percent of 15–19-year-olds to 97 percent of 30–34-year-olds and 100 percent of 35–39-year-olds. However, in recent years there has been a trend toward slightly later marriage: In 1978, 59 percent of women aged 15–19 were ever married, a proportion 14 percentage points higher than that of 1986. Divorce and remarriage are common occurrences in Senegal: Among the women sampled in 1986, 29 percent were no longer in their first unions, but 90 percent of these women had remarried.

Although the practice of polygamy remains widespread, the proportion of married women living in polygamous unions has declined slightly since 1978, from 49 percent to 47 percent. Urban women are less likely than rural women to be in polygamous unions (41 percent vs. 49 percent). Further, the proportion of women in such unions decreases as educational level increases, from 49 percent of women with no education to 36 percent of those with a primary education and 27 percent of those with a secondary education.

In 1986, the total fertility rate (TFR) among women aged 15–44 was 6.4 births per woman, down from 7.0 per woman in 1978. The decline in the overall TFR between 1978 and 1986 was due primarily to a drop in fertility levels among urban and educated women under the age of 30; among rural and uneducated women and among those over 30, fertility remained basically unchanged during this period. On average, rural women have almost two more births than urban women (7.1 vs. 5.4), and uneducated women have nearly twice as many births as educated women (6.8 vs. 3.7).

Overall, 26 percent of all married women were exposed and 74 percent were not exposed to the risk of pregnancy at the time of the survey. The proportion of exposed women was highest among those aged 15–19 (41 percent) and lowest among those aged 45–49 (18 percent). Fifteen percent of all married women were pregnant, 19 percent were infertile, nine percent had not had a period in the eight weeks preceding the survey and 32 percent had postpartum amenorrhea. The average duration of postpartum amenorrhea—16 months—is longer than that in any other Sub-Saharan country. The length of this period is mainly attributable to the practice of prolonged breastfeeding (lasting for 19 months, on average). However, nonliterate rural women breastfeed 4–5 months longer than do their literate urban counterparts, and their menses return 5–8 months later. Although age is not a factor in the length of time a woman breastfeeds, it is a factor in the observance of postpartum abstinence: Women under 30 practice postpartum abstinence two months longer, on average, than do older women (8.6 months vs. 6.6 months).

Senegalese women continue to want

large families, although the ideal family size among married women declined from 8.8 children in 1978 to 7.2 in 1986. Urban women want 5.5 children, on average, and rural women want 7.6. Women who have had no schooling want substantially more children than do those with a primary or secondary education (7.4 children vs. 5.6 and 4.5, respectively).

Nineteen percent of married women say they do not want any more children, with the proportion increasing from two percent of women with no children to 62 percent of women with six or more children. Among the 81 percent of married women who want more children, 40 percent say they want to wait at least two years before their next birth. When infertile women and women who are currently practicing contraception are excluded from these categories, the results show that 12 percent of married women are in need of family planning for limiting births and 25 percent are in need for purposes of spacing births. Among potential limiters, four percent say they intend to use contraceptives; among potential spacers, 11 percent say they will do so.

Contraceptive Knowledge and Use

The proportion of all women who knew of at least one contraceptive method grew from 60 percent in 1978 to 90 percent in 1986. During the same period, the proportion of all women who were familiar with at least one modern method tripled, from 23 percent to 69 percent. Of the modern methods, more than half of all currently married women have heard of female sterilization and the pill; fewer than one-third have heard of the IUD, injectables and condoms; and fewer than one in 10 are familiar with vaginal methods and vasectomy. Prolonged abstinence is the best-known traditional method of contraception, followed by the use of *gris-gris* (charms) and medicinal plants and the practices of periodic abstinence and withdrawal. Both education and urbanization have a positive impact on the likelihood that a woman will be familiar with a modern method, and over 80 percent of all women who are familiar with a modern method know where they can go to obtain it.

Although the proportion of married women who practice contraception has tripled since 1978, only 11 percent of women currently use contraceptives. Nine percent rely on traditional methods (mainly prolonged abstinence), while only two percent rely on modern methods. Modern methods are used almost exclusively by urban, educated women between the ages of 25 and 39. One percent of all users take oral contraceptives, the most commonly used modern method.

When women not practicing contraception were asked their future intentions, 12 percent said they would start using a method within a year, 12 percent said they would consider doing so later or were not sure and 77 percent said they did not intend to use a method. Of the women who said they would start using contraceptives in the coming year, 57 percent said they would use a modern method (32 percent, the pill; 12 percent, injectables; eight percent, the IUD; and four percent, female sterilization), and 43 percent said they would use a traditional method (mainly abstinence or gris-gris).

Maternal and Child Health

Overall, more than 60 percent of the women who had had a child in the five years preceding the survey had consulted a health practitioner at least once during their pregnancy. However, whereas almost all urban and educated women had made a prenatal visit, only 46 percent of rural women and fewer than 60 percent of uneducated women had done so. Only 41 percent of all women delivered their babies in a health facility, while 58 percent delivered at home—with 26 percent using a traditional birth attendant, 26 percent being assisted by neighbors or relatives and six percent getting no assistance.

Despite a post-1975 decline of 28 percent in the infant mortality rate and one of 40 percent in the child mortality rate, levels of early mortality in Senegal remain among the highest in Africa. The infant mortality rate for 1981–1985 was 86 deaths per 1,000 infants. About one Senegalese child in five dies before the age of five. The infant mortality rate is considerably higher among women who bear a child before age 20 than among those who bear one after that age, and children who are born fewer than two years after the preceding child are twice as likely to die as those who are born four or more years after. Moreover, the likelihood of dying is about two times higher among rural children than among urban children, as well as among the children of nonliterate mothers when compared with those of literate mothers.

It is estimated that a quarter of all Senegalese children suffer from chronic malnutrition. Further, diarrhea among children is very prevalent: Almost 40 percent of all children under five had had an episode of diarrhea in the two weeks preceding the survey, yet only seven percent of mothers had recourse to oral rehydration therapy. Malaria also poses a serious threat to children's health: Half of those under five had the disease during the winter preceding the survey; 93 percent of these cases were treated.

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AIDS Education Is Found To Improve Condom Use By Prostitutes in Kenya

Within six months of the initiation of a simple intervention program in Nairobi that presented community forums on preventing sexually transmitted diseases (STDs) and offered free condoms to prostitutes, occasional condom use quadrupled among prostitutes who were individually counseled about human immunodeficiency virus (HIV) and AIDS and tripled among those who only attended the forums. Concomitantly, occasional use more than doubled among prostitutes who could not avail themselves of the free condoms. Prostitutes who attended the forums were more likely to use condoms than were those who had not participated. Eight in 10 counseled prostitutes said they would refuse clients who would not use a condom, compared with only five in 10 of the others. The investigators who conducted the study conclude that a simple, inexpensive intervention can potentially reduce women's risk of acquiring AIDS.[1]

In January 1985, researchers registered 595 prostitutes from an impoverished area of Nairobi to attend a primary health care clinic at least once every six months for STD diagnosis and treatment. For a smaller study on condom use, the researchers identified 161 women from the original sample who had attended any one of three community meetings (called *barazas*) on preventing the spread of STDs, HIV and AIDS that were held between November 1985 and November 1986. In May 1986, 94 of these prostitutes received individual education on HIV and AIDS and were informed of their HIV status; the remaining 67 women received no individual education but were informed of their HIV status when they reported to the clinic for a screening. In the following month, the

clinic began providing free condoms. In October, the researchers recruited 205 more prostitutes to serve as a control group; although some of these women had attended a baraza, they had had no direct access to free condoms until they registered with the clinic. In November 1986, trained interviewers queried all participants about the frequency of their past and current condom use.

The three groups of women were of similar mean age (between 30 and 33). However, those who received individual counseling had practiced prostitution for an average of 45 months, at least nine months longer than either of the other groups. The controls averaged six partners daily, while the other prostitutes averaged four. Both the counseled women and the noncounseled clinic group had attended two barazas, on average, while the controls had attended one.

Only 7–10 percent of the prostitutes reported ever having used condoms before 1985. By the end of 1986, however, 81 percent of the counseled prostitutes, 70 percent of the noncounseled clinic group and 58 percent of the controls reported having used them occasionally. Among these users, frequency varied slightly: Counseled prostitutes used condoms during an average of 39 percent of their encounters, women in the other clinic group did so 35 percent of the time and controls used them 26 percent of the time. Nineteen percent of those who were individually counseled reported that they had never used condoms, compared with 30 percent of the noncounseled clinic attendees and 42 percent of the controls. Among all the prostitutes who had used condoms, 34–44 percent reportedly used a condom with fewer than half of their clients, 21–26 percent used one with more than half, and only 3–11 percent used a condom with every client. The most frequently given reason for condom use by women in each group was concern for their health and avoidance of HIV and AIDS.

Those groups with free access to condoms were significantly more likely both to have proposed that their clients use a condom and to have provided the device themselves: Among the prostitutes who used condoms, the counseled women initiated condom use in 78 percent of their encounters, compared with 64 percent among those who were in the noncounseled group and only 59 percent among the controls. In addition, the counseled and noncounseled prostitutes provided the condoms in 58–59 percent of the instances in which they were used, compared with 40 percent among the controls. Significantly more individually counseled prostitutes (80 percent) claimed they would refuse to have sex with a man who would not wear a condom than did noncounseled prostitutes (51 percent) or those in the control group (52 percent).

Regression analysis indicated that attendance at barazas was the only variable significantly associated with condom use. No other variables—whether the woman received individual counseling, whether she attended the clinic regularly for screening or only when a health problem arose, how long she had been a prostitute, how many sexual partners she had per day or whether she had been refused by a client—were associated with condom use. Women infected with HIV were as likely to use condoms currently as were the uninfected.

Although condom use increased substantially among the counseled and noncounseled women, it also rose among the controls. The researchers do not claim that attendance at the barazas led to this increased use of condoms among the controls; they surmise that, in an atmosphere of "vigorous discussion" about AIDS in Kenya, there may have been "a 'spill over' effect from informal contacts" among the women in all the groups, resulting in an increase in condom use among the controls. They conclude, however, that while the barazas appeared effective, "judging by the onset of use, making condoms easily available seemed in itself to be an extremely effective measure in increasing condom use." Nevertheless, they consider their findings to be "evidence that public education programmes on AIDS in Africa can effect important changes in sexual behaviour that reduce the risk of transmission of HIV."

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Iran's Rate of Population Growth—Nearly Four Percent Annually—Is One of World's Highest

Iran now has a population of over 50 million, and its annual growth rate is among the highest in the world. A heavy flow of immigrants into the country, high levels of fertility and falling mortality rates have outweighed population losses due to war and emigration, according to Mehdi Amani, a researcher who analyzed preliminary data from Iran's 1986 census.[1] While early and universal marriage remain the norm in Iran, the average age at marriage is rising among women and falling among men.

Iran's population is predominantly young (46 percent under age 15) and is growing at a rate of at least 3.7 percent annually. Between 1966 and 1986, the population almost doubled, from 25.8 million to 49.9 million. Amani estimates that based on the annual rate of population growth between 1976 and 1986, Iran's population should reach almost 54 million in 1988.

In 1986, the crude birthrate was about 43 births per 1,000 population, and the crude mortality rate was approximately 12 deaths per 1,000. The ratio of infants under five to women aged 15–44 (0.93) is higher than that in West Africa (0.87), and indicates that Iran has very high levels of fertility.

Fifty-five percent of the population live in urban centers, compared with 39 percent 20 years ago. Almost half of the urban population is concentrated in the 10 largest cities; Teheran, the nation's capital, has a population of over six million. Overall, the average household size is over five, but urban households are smaller than rural ones (4.8 vs. 5.5 persons).

By ages 50–54, 99 percent of Iranians have been married. Iranian women have always married young; however, their average age at marriage rose from 18.6 in 1956 to 19.9 in 1986. During the same period, the average age at marriage among men declined from 25.5 to 23.8. According to Amani, later marriage among women is attributable to increasing education (only seven percent of women were literate in 1956, compared with over 50 percent in 1986), while earlier marriage among men is a consequence of the return to traditional family values espoused by the Islamic revolution.

The researcher notes that the actual size of Iran's population surpasses earlier population projections made by the United Nations and the Iran Statistics Center. Although there are no precise data on fertility, emigration, immigration and deaths due to war, he speculates that most of the "excess" population results from the in-

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flux of Afghans fleeing war in their own country and, to a lesser extent, from a rise in fertility levels (in the absence of family planning).

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Paraguay: Few Changes Found in FP Practice or Fertility in Past 10 Years

Fertility levels and contraceptive prevalence in Paraguay have remained virtually unchanged since the late 1970s. The total fertility rate (TFR) is 5.4 lifetime births per woman, fewer than four in 10 married women use effective birth control methods and at least one in five women are in need of family planning services. Married women most frequently rely on oral contraceptives, but second in popularity, in the capital as well as the countryside, are native herbs that have no proven contraceptive effect. The majority of women who practice birth control obtain their contraceptives from pharmacies, a change from their previous reliance on government family planning services, which were suspended in 1979. According to the authors of a recent fertility survey report, Paraguay's fertility trend is consistent with that of a very limited public-sector family planning program.[1]

The Centro Paraguayo de Estudios de Población (CEPEP), the International Planned Parenthood Federation affiliate in Paraguay, conducted the Paraguay Family Planning Survey in the spring of 1987 with assistance from the U.S. Centers for Disease Control. Paraguay is divided into two regions—the sparsely populated Occidental region (which was excluded from the study) and the Oriental region, where 98 percent of the country's people live. For the study, an equal number of households were obtained from two areas of the Oriental region—metropolitan Asunción and the Interior. Interviewers gathered data from 2,224 women aged 15–44 of all marital statuses, almost two-thirds of whom were currently married.

Fertility and Breastfeeding

The current TFR is 5.4 lifetime births per woman; this is a decrease from 6.3 in 1977 (estimated from a Contraceptive Prevalence Survey) but an increase from 4.9 in 1979 (estimated from the World Fertility Survey). However, an analysis of survey data from the 1970s revealed the 1977 TFR to have been overestimated. Furthermore, the apparent increase in TFR between 1979 and 1987 may be exaggerated, according to the authors, because of response errors and sample size constraints in the latter survey. Nevertheless, they note that the current TFR in Paraguay is surpassed by only four other Latin American countries—Bolivia, Guatemala, Honduras and Nicaragua.

The mean parity per woman is 2.2, a decrease of 0.4 from the 1977 level of 2.6. Between 1977 and 1987, mean parity diminished by 0.6 children among women living in the Interior, while mean parity among women in Asunción increased by 0.3 children (from 1.3 children to 1.6 children) during the same period. Women living in the Interior have one more child (2.5 children per woman), on average, than those living in Asunción (1.6 children per woman); the largest differentials, as great as two children per woman, occur among women older than 30.

Most Paraguayan mothers breastfeed their children, and the average duration is 12.7 months, virtually unchanged from what it was in 1979. Women with the least education breastfeed for almost twice as many months as do women with more than a primary education, and those living in Asunción breastfeed for an average of five months less than do women in the Interior. Postpartum amenorrhea persists for an average of 7.6 months, but lasts for three months less among women in the capital than among those in the Interior. Women with less than a primary education experience postpartum amenorrhea for almost twice as many months as do women with more than a primary education.

Eighty-three percent of the women who had a pregnancy within five years of their interview say it was planned—an increase from 71 percent in 1977. The authors explain that the increase is the result of an improved ability among couples to space pregnancies; mistimed pregnancies account for 12 percent of the total number of pregnancies, a decrease from 24 percent in 1977. Four percent of the women report that their most recent pregnancy was unwanted, a very slight decrease from 1977; the remainder could not classify the status. The distribution of the planning status of pregnancies does not differ between women living in the capital and those living in the Interior.

Contraceptive Use and Unmet Need

Thirty-eight percent of currently married women use a family planning method with some recognized efficacy, and seven percent of the women report using native herbs called *yuyos*, which have no proven contraceptive effect. Only 29 percent of currently married women use a modern contraceptive such as the pill (14 percent), the IUD (five percent), sterilization (four percent), injectables, (four percent), condoms (two percent) or vaginals (half of one percent); withdrawal and rhythm are used by nine percent.

Whereas over half of women living in Asunción use a method of birth control that has some recognized efficacy, fewer than one-third of women living in the Interior do so. Oral contraceptives are the most prevalent method in both areas, followed in popularity by the IUD among women living in the capital and sterilization among women in the Interior. Contrary to the investigators' expectations, almost twice as many women in Asunción as women living in the Interior report using yuyos (11 percent vs. six percent).

Among married women, contraceptive prevalence varies by age and number of living children. Use of methods with some recognized efficacy ranges from 23 percent among 15–19-year-olds to 43 percent among 25–29-year-olds and from 15 percent among women with seven or more children to 52 percent among those with two children. Twenty-six percent of women with less than a primary education use such methods, a proportion that increases to 61 percent among those with more than a primary schooling. Twenty-four percent of women who only speak Guarani (the principal language for one-third of the sample) practice contraception, compared with 58–61 percent among those who rely solely on Spanish or another language. Use of yuyos is highest among women 15–24-years-olds and among those 40 and older. Women who speak Guarani are more likely to use native herbs than are women who speak Spanish or another language. The prevalence of herb use increases with number of living children and decreases with education.

The proportion of married women who employ a method other than yuyos increased nine percentage points over 10 years. The increase was primarily in the use of modern contraceptives, particularly oral contraceptives and injectables. Nevertheless, this improvement, which was accompanied by a very slight increase in breastfeeding duration, did not result in

diminished fertility because of an accompanying six-month decrease in the singulate mean age at marriage.

An incident that seriously affected family planning in Paraguay occurred in 1979, when the country withdrew from the program of bilateral support with the United States Agency for International Development and consequently discontinued distribution of contraceptives through its government health program. Currently, the primary suppliers of contraceptives for married women are pharmacies (the source for 51 percent), followed by CEPEP clinics (14 percent) and private physicians or clinics (12 percent). Other sources are private and public hospitals, health centers, marketplaces, churches and friends. Pharmacies supply oral contraceptives to three-quarters of women who use that method; CEPEP clinics and private physicians or clinics provide IUDs to about three-quarters of women who use them. Public hospitals are the primary site for sterilizations (for medical reasons only) among the small proportion of women who are sterilized.

The authors classified women (regardless of marital status) as being in need of family planning services if they were fecund, sexually active, neither pregnant nor interested in becoming so and either using yuyos or relying on no birth control at all; almost one-quarter (23 percent) of Paraguayan women are thus classified as in need. A greater proportion of women living in the Interior (26 percent) than those living in Asunción (15 percent) fall into this category. Of all women in need, the majority speak only Guarani (57 percent), have less than a complete primary education (61 percent), are unemployed (79 percent) or live in the Interior (80 percent).

The authors conclude that family planning program efforts targeted to women in the Interior could potentially have the greatest impact on contraceptive prevalence in Paraguay. Furthermore, they maintain that "if the availability of services and of modern and effective contraceptive methods were to be increased," a significant proportion of women, regardless of their current contraceptive practice, would utilize modern methods. According to them, family planning program efforts should initially emphasize reversible contraceptive methods, in part because only one-third of women who want to limit childbearing would consider obtaining a sterilization. Since only 35 percent of the women express an interest in community-based distribution (CBD) of contraceptives, the authors suggest that family planning services should initially be offered in a clinic setting. However, they think that with greater understanding of and knowledge about CBD programs, it is possible to increase acceptance of such programs.

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African AIDS Epidemic Expected to Have Only Moderate Impact on Population Growth Rate

As many as two percent of Central African adults could annually become infected with the human immunodeficiency virus (HIV) by the year 2000, with almost as many dying annually of AIDS, according to projections from a mathematical model for forecasting the spread of HIV and the demographic impact of AIDS.[1] However, even a severe AIDS epidemic in which one in five adults is infected would not come close to halting Africa's rapid population growth. The model suggests that in a worst-case scenario, an African society's annual growth rate might only be halved. Although death rates among adults and children under the age of five would increase substantially, the current age distribution of the population, in which children and young adults represent a sizable share, would remain relatively unaltered.

The true current incidence and prevalence rates of HIV and AIDS in Africa are uncertain, nor is it known how infectious HIV is or how readily it is spread. However, John Bongaarts, director of research at The Population Council, constructed a mathematical model to simulate, over a period of several decades, both the anticipated increases in the incidence and prevalence of HIV infection and the annual number of deaths that can be expected in a severely affected Central African population. The model relies on over 30 input parameters related to the disease's progression, the risk of sexual or nonsexual transmission and the population's demographic structure and sexual behavior.

The model distinguishes three age-groups—birth to age 15 (the presumed age of initiating sexual activity), age 15 to marriage and marriage to death. Regardless of their marital status, adults are treated as having either many sexual partners (high sexual mobility) or few (low sexual mobility). In addition, it is assumed that except for women with high mobility, sexual partners share the same cohort, no medical interventions will change the risk of HIV infection or the disease's progression, and sexual behavior will remain unchanged throughout the course of the epidemic. (Intravenous drug use and homosexuality are excluded as factors in the Africa analysis because they do not appear to contribute significantly to the epidemic there. Bongaarts notes, however, that this model cannot be appropriately applied to non-African populations if parameters that address these modes of transmission are not included.) The point of departure for the computer simulation is 1975. The model forecasts that the spread of AIDS and the disease's demographic impact will stabilize after about 25 years, and the analysis is thus limited to that time-frame.

At least one million Africans adults are now estimated by the World Health Organization to be infected with HIV, and the number could actually be as high as two or three million. Such an estimate suggests that one percent of adults are infected with HIV. The model projects that starting in 1975, the annual proportion of African adults 15–65 years old who become infected with HIV (the HIV incidence) would rise rapidly: By the 15th year of the epidemic, approximately 2.5 percent of all adults would become infected by HIV each year, an incidence level expected to stabilize at 2.2 percent in the 25th year. The total proportion of adults infected (the HIV prevalence) would rise rapidly for the first 15 years and then approach equilibrium by year 25, with prevalence levels at the zenith around 20 percent among all adults, almost 60 percent among male partners of prostitutes and almost 80 percent among prostitutes.

Nearly a decade after the plateau in the annual incidence of HIV infection is reached, the incidence of AIDS cases would be expected to peak at slightly more than 1.5 percent per year of the adult population (based on an average incubation period of 9.3 years between infection and the appearance of the syndrome). This peak would be closely paralleled by a rise in AIDS-related deaths, with around 1.5 percent of the adult population succumbing to AIDS in the 25th year of the epi-

demic. Thus, in a hypothetical population of 10 million adults, 150,000 would be expected to die of AIDS in year 25 of the epidemic alone.

In order to estimate the impact of the disease on turn-of-the-century annual population growth rates, Bongaarts made a series of assumptions about conditions in a hypothetical Central African population at the start of the epidemic: Its initial age structure is stable; life expectancy at birth is 44 for men and 47 for women; and women average 6.5 lifetime births. Furthermore, in the absence of the AIDS epidemic, life expectancy increases 7.5 years and the total fertility rate declines by 0.5 births per woman over the 25-year period. Using these conditions as a base, the model estimates the effects of several levels of HIV prevalence on annual rates of population growth and other demographic variables.

In the absence of AIDS, an annual growth rate of three percent in the mid-1970s was expected to increase to 3.2 percent by the century's end. If HIV prevalence were to reach 20 percent by the year 2000, an initial 1975 annual population growth rate of three percent would be decreased to 1.9 percent, and an initial annual growth rate of four percent would fall to 3.1 percent. (Bongaarts asserts that an HIV prevalence of 20–30 percent is probably a crude upper limit, based on current prevalence levels in the most seriously affected countries.) By the year 2000, the birthrate in Africa had been expected to decline from 49 to 45 births per 1,000 and the death rate, from 19 to 13 deaths per 1,000. While the AIDS epidemic would be expected to cause the birthrate to decline only slightly more than had been anticipated, the death rate would be expected to double to 26 per 1,000.

The age distribution of the population after 25 years of the epidemic would undergo only a relatively modest change, as long as HIV prevalence did not exceed 30 percent. Nevertheless, this estimate is considered applicable only to those countries most seriously affected; Bongaarts notes that "HIV prevalence in Africa as a whole could be less than five percent by the year 2000."

Thus, according to Bongaarts, if the epidemic does not exceed the range of this model's projections, population growth rates will probably remain high, given the current demographic conditions in Africa. However, he cautions that forecasting the spread of HIV and the demographic impact of AIDS "is a complex matter because a wide variety of behavioral, epidemiological, and demographic factors affect the course of the epidemic." Bongaarts concludes that even if the effects of AIDS on the growth rate and age structure are not major, the number of deaths from the disease will be large, and death rates could double in those countries most severely affected, "with disastrous effects on the health care system, the economy, and the fabric of society."

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Cholesterol Levels May Be Altered by Hormones In Some Combined Pills

The progestogen component of combined oral contraceptives induces changes in serum lipid levels that may affect a woman's risk of developing certain diseases, according to a recent prospective study conducted by the World Health Organization. For example, pills containing the progestogen levonorgestrel raise the level of low-density lipoprotein cholesterol and decrease the level of high-density lipoprotein cholesterol; both types of changes have been associated with an increased risk of atherosclerosis. On the other hand, pills containing norethisterone acetate do not appear to cause such unfavorable changes in cholesterol levels, although they do raise levels of serum triglycerides.[1]

The study was carried out among female volunteers aged 18–35 at research centers in Bangkok, Thailand; Göteborg, Sweden; and Mexico City, Mexico. Women who had used hormonal steroids fewer than 70 days before admission to the study were excluded, as were those who had previously used hormonal contraceptives for more than three years. Participants were randomly assigned to take pill preparations containing 250 mcg of levonorgestrel and 50 mcg of ethinyl estradiol; 250 mcg of levonorgestrel and 30 mcg of ethinyl estradiol; 150 mcg of levonorgestrel and 30 mcg of ethinyl estradiol; or 1 mg of norethisterone acetate and 50 mcg of ethinyl estradiol. In addition, members of a control group of users of the TCu 220c IUD were recruited at each center.

Blood samples were taken from all participants at entry and again during the third and 12th months of the study to measure levels of high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, total cholesterol and total triglycerides. The researchers compared the serum lipid levels measured among women taking each of the four pill preparations with those found among IUD users. Results were examined for all centers combined, as well as for each individual center.

The final sample, which included only the women who remained in the study for the full 48 weeks, consisted of 241 pill users and 87 IUD users, representing 59 percent and 72 percent, respectively, of the women originally recruited. Follow-up rates varied among the centers: Only 40 percent of the women recruited in Mexico completed the study, compared with 79 percent and 74 percent of those recruited in Göteborg and Bangkok, respectively.

At baseline, compared with controls, women assigned to take the pill were younger, had higher blood pressures and had lower levels of HDL cholesterol, total cholesterol and total triglycerides. Further, pill users were more likely than IUD users to have used a combined oral contraceptive as their last method before entering the study (30 vs. 16 percent) and were less likely to have previously used an IUD (nine percent vs. 51 percent, respectively). There were no significant differences in baseline characteristics among women using the four different pill preparations.

At 12 and 48 weeks, there were no significant differences in total cholesterol levels between any of the pill groups and the control group. Differences in total cholesterol levels among women taking the four different pill preparations reached borderline statistical significance only in Göteborg, where women who were taking the preparation with less estrogen (250 mcg of levonorgestrel and 30 mcg of ethinyl estradiol) had lower total cholesterol levels than those who were taking the formulation with the higher estrogen content (250 mcg of levonorgestrel and 50 mcg of ethinyl estradiol).

Women who took either of the pill preparations containing 250 mcg of levonorgestrel experienced a significant rise in their LDL cholesterol levels when compared with the control group: At 48 weeks, levels of LDL cholesterol among these women were about 12–15 percent higher than those measured among IUD users. LDL cholesterol levels among women who took the pill containing 150 mcg of levonorgestrel were also higher than those meas-

ured among controls, but the difference was statistically significant only in Göteborg. On the other hand, LDL cholesterol levels among women who took pills containing norethisterone acetate did not differ significantly from those among controls in any center.

Overall, as well as in each individual center, women who took oral contraceptives containing 250 mcg of levonorgestrel experienced a significant decrease in HDL cholesterol levels compared with controls: At 48 weeks, the average HDL cholesterol levels were nine percent lower among users of the 250 mcg of levonorgestrel and 50 mcg of ethinyl estradiol pill and 13 percent lower among users of the 250 mcg of levonorgestrel and 30 mcg of ethinyl estradiol preparation when compared with the average level among IUD users. By the end of the study, there were no significant differences in HDL cholesterol levels between the controls and users of pills containing 150 mcg of levonorgestrel or norethisterone acetate.

The ratios of HDL cholesterol to LDL cholesterol and of HDL cholesterol to total cholesterol were significantly lower among women who used either of the pills containing 250 mcg of levonorgestrel and were somewhat lower among those who used the pill containing 150 mcg of levonorgestrel than they were among the controls. Neither the former ratio nor the latter ratio was significantly lower among women who took the pill containing norethisterone acetate than among the controls.

However, triglyceride levels among women who took the pills containing norethisterone acetate were significantly higher than those among controls: At 48 weeks, triglyceride levels were 34 percent higher than among IUD users.

Analysis of the effects of each of the four pill preparations on serum lipid levels revealed significant differences between the two progestogens. When pills containing 250 mcg of levonorgestrel and those containing norethisterone acetate are each combined with the same dose of estrogen, those containing levonorgestrel induce a greater increase in levels of LDL cholesterol, a greater decrease in levels of HDL cholesterol and a greater decrease in the HDL/LDL and HDL/total cholesterol ratios. Further, the results show a dose-effect of levonorgestrel on serum lipids: Pills containing 250 mcg of levonorgestrel bring about a greater increase in levels of LDL cholesterol and a greater decrease in both ratios than do those containing 150 mcg of levonorgestrel.

The precise effect of decreases in levels of HDL cholesterol and in the HDL/LDL and HDL/total cholesterol ratios requires further research. There has been some speculation that these changes might produce an increased risk of myocardial infarction. However, one large study found that compared with never-users of the pill, women who take pills containing levenorgestrel are at a decreased risk of acute myocardial infarction.[2]

The WHO researchers conclude that before prescribing a combined oral contraceptive, clinicians should consider the clinical status of their patients—in particular, their cardiovascular condition and whether they have hypertriglyceridemia. Finally, since most of the effects on lipid levels were dose-related, clinicians should always suggest that their patients use the pill preparation containing the lowest effective dose of a particular hormone.

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Percentage of Men and Women Aged 55 and Older Is Growing Rapidly in Many Developing Countries

Although the low-fertility developed countries are known to have a large proportion of older citizens within their populations, the phenomenon is building unrecognized in developing countries as well, according to an analysis by the U.S. Bureau of the Census of the populations of 22 such countries.[1] In fact, 58 percent of people aged 55 and older currently live in developing countries, and this proportion will increase as time goes on. Almost one million persons in the Third World reach the age of 55 each month; the resulting annual growth rate among the older population is slightly more than three percent, a rate three times that of the developed countries.

The data for the report come from the International Data Base on Aging, computerized files covering a wide variety of variables that are maintained and updated by the Center for International Research within the Bureau of the Census. The data, while not necessarily representative of the developing world as a whole, pertain to 10 countries in Asia, five in Africa and seven in Latin America and the Caribbean (see Table 1); these countries were selected based on data availability, regional representation and importance to the Agency for International Development.

Among the developing regions, the Caribbean has the "oldest" population: Twelve percent of its citizens are 55 and older, compared with 10 percent in Asia, nine percent in Latin America and seven percent in Africa. The report notes that several factors tend to produce older populations in some countries within a region than in others, including a low-fertility rate and emigration of working-age individuals. As Table 1 shows, the proportions can vary greatly among countries within a region; in Asia, for example, the share of the population 55 and older ranges from seven percent in Bangladesh to 17 percent in Hong Kong. Overall, proportions among individual countries range from five percent in Kenya to 22 percent in Uruguay.

The table also indicates how these proportions will change during the next 30 years. By 2020, the proportion of the population 55 and older will double in a majority of Asian countries and will triple in Singapore. Although the proportion will

Table 1. Percentage of population aged 55 and older in 22 developing nations, 1988 and projection for 2020

Country	1988	2020
Asia		
Bangladesh	7.2	11.5
China	12.2	24.0
Hong Kong	17.0	34.5
India	8.6	14.8
Indonesia	7.8	16.4
Rep. of Korea	10.4	23.0
Philippines	7.5	11.6
Singapore	11.9	33.5
Thailand	9.0	18.4
Turkey	9.7	15.6
Africa		
Kenya	5.1	5.6
Malawi	6.3	5.8
Morocco	8.7	13.3
Tunisia	9.9	14.9
Zimbabwe	6.0	6.3
Latin America & the Caribbean		
Brazil	9.0	15.6
Costa Rica	8.7	19.1
Guatemala	7.2	11.8
Jamaica	12.0	16.6
Mexico	8.4	16.0
Peru	8.3	13.6
Uruguay	22.0	23.3

increase slightly in most African countries, it is projected to decline in Malawi. In Latin America and the Caribbean, the proportion will increase moderately in every country except Uruguay, where it will remain about the same.

The median age in almost all the countries in the study is currently younger than 25, and ranges from 19 in Kenya to 33 in Uruguay. However, these medians are expected to rise by 8–10 years over the next three decades; by the year 2020, countries such as Hong Kong and Singapore are expected to have median ages older than 45.

Although the majority of all persons 55 and older live in the developing world, 57 percent of those 75 and older are currently living in industrialized countries. However, this is the fastest growing group within the older population of the developing world, and by the turn of the century, the majority of people aged 75 and older (61 percent) will be living in developing nations, too.

Overall, average life expectancy at birth is 59 years in the developing world, but this average ranges from about 50 years in Bangladesh and Malawi to more than 75 years in Hong Kong, Costa Rica and Jamaica. Although the life-span advantage that women in the developed world have over men is not as great in the developing world, women outlive men in all the countries studied except Bangladesh, where men live 2.3 years longer than women. The report attributes this reversal of the typical worldwide pattern to the low social status accorded women and to the preference that men often receive in the use of scarce resources ranging from medical care to education.

Nonetheless, in most developing countries, as in the developed world, the proportion of women in the older population increases with age. In only four countries—Bangladesh, Zimbabwe, Morocco and Tunisia—do men outnumber women at ages 60 and older. Countries such as Hong Kong, Uruguay and the Republic of Korea already show the large female imbalances at older ages that are seen in industrialized nations, and this pattern is expected to be present by the year 2020 in most of the other countries as well.

The report points to growing concern in some countries, however, over whether traditional mechanisms of support will continue to absorb increasing numbers of widows. In societies in which social security and pension benefits rarely cover more than a small portion of the population, older women have traditionally relied upon extended families and similar informal social systems for support; elderly people rarely live alone, for example. Yet as families become smaller and young women increasingly enter the work force, the prospects that older persons will have children who can provide care and attention are diminishing. The rapid pace of urbanization exacerbates the estrangement of the elderly, as younger persons migrate to the cities, leaving rural populations disproportionately older.

While most women of the developing world have never been employed, the poor economic conditions in developing countries often mean that males who reach older ages cannot stop working. In few developed countries are more than 20 percent of men aged 65 and older in the work force; the proportions are much higher in developing countries, however, reaching 69 percent in both Mexico and Bangladesh.

Surveys from the early 1980s indicate that tremendous differences in educational levels exist between the younger and older generations in a number of countries, with older women being the least educated of all. For example, in China, 41 percent of men aged 25–44 have a secondary education, compared with eight percent of men 60 and older; comparable figures for women are 22 percent and one percent. With the exceptions of Hong Kong and Korea, educational levels are lower in the other developing countries than they are in China.

The report presents an analysis of the number of "dependent" persons (generally defined as those younger than 20 and older than 64) per 100 persons of working age (20–64 years). Although the dependent population in developing countries is now overwhelmingly concentrated in the younger age-group, that pattern will have changed considerably in three decades. In China, for example, 12 percent of the dependent population is currently 65 or older, but in 2020 that proportion will have grown to 31 percent. In Costa Rica, Thailand and Tunisia, eight percent of the dependent population is currently in the older age-group, but in 2020 the proportions will be 23 percent, 20 percent and 16 percent, respectively.

The aging of societies actually represents a success story, the report points out, because it means that infant mortality rates, the incidence of infectious diseases and fertility rates are being reduced and that education and health are improving. However, the study also notes that older populations require different social support services than young populations and that developing nations will have to recognize and plan for these changes if they are to age gracefully.

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Books in Review

A Feminist Critique Critiqued

Reproductive Rights and Wrongs: The Global Politics of Population Control and Contraceptive Choice
by Betsy Hartmann, Harper and Row, New York, 1987, $24.45 (cloth), $10.95 (paper), 368 pp.

Reviewed by Rebecca Cook and Ann Leonard

With *Reproductive Rights and Wrongs*, Betsy Hartmann has written an angry book, expressing her resentment at how, in her view, population control agencies have failed to respect the individual wishes and needs of women in developing countries. She selects her evidence to build a case that such agencies have served the developed world's agenda to preserve the status quo of international inequality by inducing women to accept inadequately tested and delivered contraceptive methods, thereby risking their personal health and individual dignity. Hartmann condemns the attempt to use population control as a "quick fix" for the perceived problems of rapid population increase in the developing world.

The author contends that pressure from international population control agencies has set the direction for family planning programs in the developing world, and she draws particularly on the experiences of Bangladesh, India and Indonesia. In Chapter 4, for example, she charges that Suharto, Indonesia's current ruler, came to embrace the philosophy of population control as a result of "the influence of Western-trained technocrats" [p. 74]. Elsewhere, in Chapter 11 Hartmann argues that the major international donors pressured Bangladesh to dramatically increase its focus on sterilization; she explains that "whereas before, village women were neglected by Bangladesh's family planning program, now they are targets of an aggressive sterilization drive that uses incentives and intimidation to produce results" [p. 211]. The true problems behind high fertility, according to the author, are female poverty and powerlessness, and these are at least ignored and often exacerbated by Western-funded population control efforts.

Drawing from her own observations, the author establishes her thesis that women in developing countries have sometimes been coerced into using particular methods of family planning. However, the author regrettably fails to acknowledge adequately the efforts of agencies such as the World Federation of Health Agencies for the Advancement of Voluntary Surgical Contraception to work with providers to identify the potential for abuse and ensure voluntary choice.*

Nonetheless, the quality of reproductive health care in many parts of the world is just as appalling as Hartmann vividly depicts. Furthermore, the risks and burdens of contraceptive use continue to fall disproportionately on women. For example, worldwide, women are generally sterilized at much higher rates than men, despite the well-known fact that vasectomy carries fewer health risks and is far less costly than female sterilization.

Hartmann decries the extent to which international agencies have influenced the direction of contraceptive research by focusing on hormonal or surgical methods that leave as little room as possible for user error and ignoring barrier methods and natural family planning, which rely—inconveniently—on the compliance of individual users. She argues that the contraceptive choices thereby presented to women often produce dangerous side effects and represent significant health risks, which may not always be discussed with the women expected to use the methods. "The misdirection of contraceptive technology," she asserts, "begins in the research phase and culminates in its use as a destructive and even deadly weapon in the war on population" [p. 161].

Hartmann's assertions on this point are based to a large extent on rather dated information; she makes little mention, for example, of more recently organized programs that favor barrier methods, natural family planning and an expanded role for males within family planning. The author also may place too much emphasis on the future development of injectable and subcutaneous hormonal contraceptives, which form only one part (and not necessarily even the major portion) of international agencies' plans.

The author is skeptical of new programmatic approaches to family planning that seek to integrate women's development projects, primary health care services and community participation, claiming that they deflect attention from women's true needs. In dismissing the concepts behind present policies as politically naive and based on a fear of women's desire to control more than their fertility, she offers a different prescription for addressing the realities of poverty and powerlessness—equal access to education, employment, capital and land.

The underlying criticism here is that family planning organizations have collaborated too closely with the prevailing powers in the developing world and have not spurred the kind of socioeconomic change that would undermine established power structures and replace them with others more favorable to poor women. For

Rebecca Cook is assistant professor in the faculty of law and the faculty of medicine at the University of Toronto, Toronto, Canada. Ann Leonard is deputy director for programs at International Projects Assistance Services, Carrboro, North Carolina.

*Some of these activities are described in: World Federation of Health Agencies for the Advancement of Voluntary Surgical Contraception, *Voluntary Choice and Surgical Contraception*, New York, 1987.

example, in citing the example of Bangladesh, Hartmann asserts that major donors' aid has gone to supporting the small, wealthy minority and has "strengthened the hand of the Bangladesh military, . . . stifling attempts to restore democracy and initiate positive social change" [p. 211].

While Hartmann's anger is comprehensible, a question remains: How realistic is her prescription? International family planning agencies are not equipped to change the international economic order. What they can do, are doing and must do even better is promote increasingly higher standards of care and advance equal access to health services by removing such barriers as spousal authorization requirements, by promoting male involvement and by encouraging novel initiatives, such as the legal services program for women sponsored by Colombia's family planning organization, PROFAMILIA.* However, although agencies in the family planning field cannot change the large-scale economic order, as Hartmann advocates, they can influence both the domestic and international *family* order by demonstrating the positive influence of sexual equality on the operation of family planning programs.

One of the book's disappointments is the author's failure to relate her description and analysis to important events in the world over the past decade that presage greater empowerment for women. Since 1975, in the legal area alone, at least 86 countries have included amendments on sexual nondiscrimination in their constitutions, and 97 have ratified the Convention on the Elimination of All Forms of Discrimination Against Women.

Along with these developments, a strong international feminist movement is taking hold around the world, and while feminism shares a common goal—the fight against the oppression of women—it is not a monolithic movement. Betsy Hartmann neither recognizes the many different strands of feminist thought nor identifies the school of feminism to which she adheres, although her writing seems to identify her with that of socialist feminism. It would have been helpful if Hartmann had presented some of the differing points of view among feminists regarding health care. For example, the author does not discuss the ambivalence that some feminists feel regarding the fight for greater autonomy for women: Some question whether women subjected to longstanding cultural conditioning can become autonomous without first developing a new vision or sense of self, a step that for some may not be achievable in the foreseeable future.

Unfortunately, some feminists (usually from developed countries) are too impatient to wait for the cultural and social evolution that may be necessary for the exercise of true autonomy, and often show a kind of paternalism in claiming to know better than other women what those women want. Some feminists from the developed world have even played a role in destroying programs that feminists from the developing world approved as responsive to their health needs.

Pluralism is important in any social movement, and the multiplicity of feminist views on family planning provision and women's health must be taken seriously by family planning professionals around the world. It is not enough for the family planning movement to respond only to the arguments and complaints of conservative, often religiously motivated opposition around the world; it must also respond to feminist critics such as Betsy Hartmann. She, like most feminists, no matter how critical, is sympathetic to the professed goals of the family planning movement and presents that movement with the challenge of keeping faith with the values it claims to serve—the most important being the protection of women's reproductive autonomy.

*For information about this program, see: M. I. Plata, "Family Law and Family Planning in Colombia," *International Family Planning Perspectives*, 14:109, 1988.

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